SERVICE MANUAL

MULTI SYSTEM SERIE

MS-H07AIC PT, MS-H09AIC PT
MS-H12AIC-PT, MS-H18AIC PT

sinclair
AIR CONDITIONING

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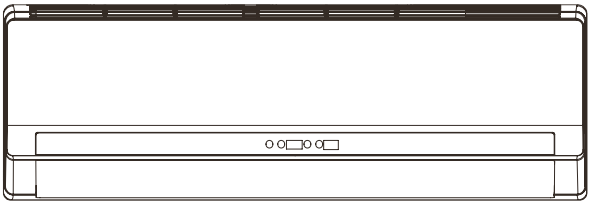
Part Ⅰ : Technical Information

1. Summary

Indoor Unit:



Remote Controller:

YT1F(XFAN)

2. Specifications

2.1 Specification Sheet

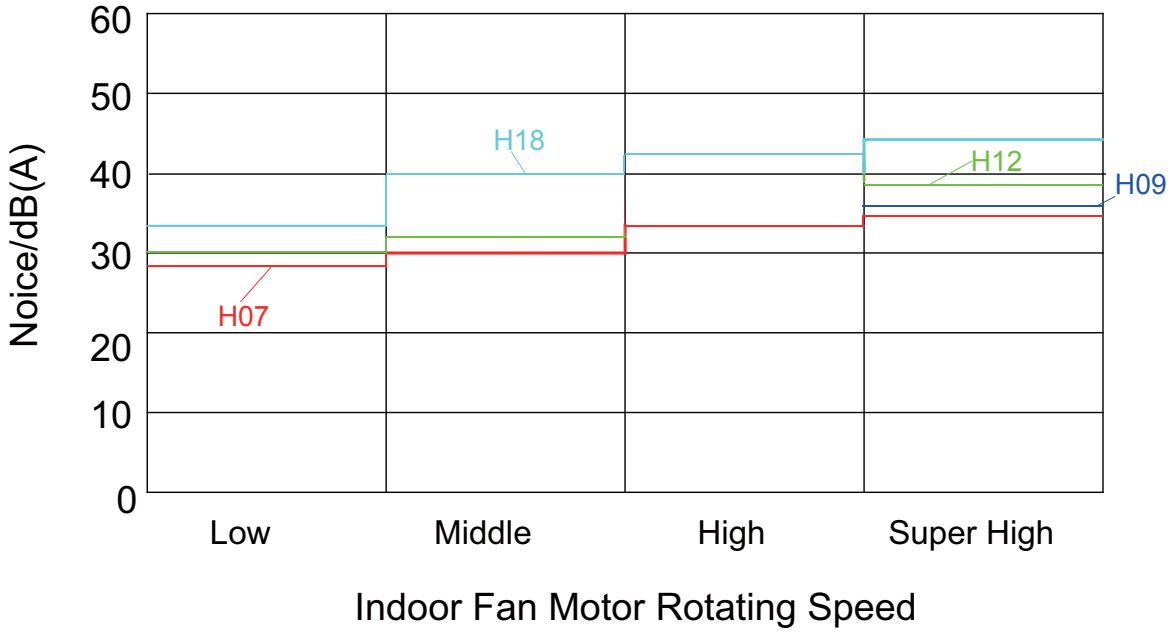
Model		MS-H07AIC PT	MS-H09AIC PT
Rated Voltage	V~	220-240	220-240
Rated Frequency	Hz	50	50
Phases		1	1
Cooling Capacity	KW	2.1	2.6
Heating Capacity	KW	2.6	2.8
Air Flow Volume (SH/H/M/L)	m^3/h	450/410/380/320	500/410/380/320
Dehumidifying Volume	L/h	0.6	0.6
Fan Type		Cross-flow	Cross-flow
Fan Diameter-height	mm	Φ85X596	Φ85X596
Fan Motor Speed (SH/H/M/L) Cool	rpm	1260/1050/920/730	1260/1050/920/730
Fan Motor Speed (SH/H/M/L) Heat	rpm	1320/1200/1100/950	1320/1200/1100/950
Fan Motor Power Output	W	10	10
Fan motor running current	A	0.144	0.144
Fan Motor Capacitor	μF	1	1
Evaporator Material		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
Evaporator Pipe Diameter	mm	7	7
Evaporator Number of Rows		2	2
Evaporator Fin Pitch	mm	1.5	1.5
Evaporator Length(L)XHeight(H)XWidth(W)	mm	581X267X25.4	581X267X25.4
Motor Model		FN10A-PG	FN10A-PG
Overload Protector		3.15	3.15
Motor Full Load Amp(FLA)	A	0.144	0.144
Sound Pressure Level (SH/H/M/L)	dB (A)	36/34/31/28	37/34/31/28
Sound Power Level (SH/H/M/L)	dB (A)	51/49/46/43	52/49/46/43
Outline Dimension (WXHXD)	mm	790X174X265	790X174X265
Package Carton Dimension (LXWXH)	mm	870X248X355	870X248X355
Package Dimension (LXWXH)	mm	873X251X370	873X251X370
Net Weight	kg	9	9
Gross Weight	kg	11	11
Liquid pipe	mm	Φ6	Φ6
Gas Pipe(to indoor unit)	mm	Φ9.52	Φ9.52
Note: The connection pipe applies metric diameter.			

The above data is subject to change without notice; please refer to the nameplate of the unit.

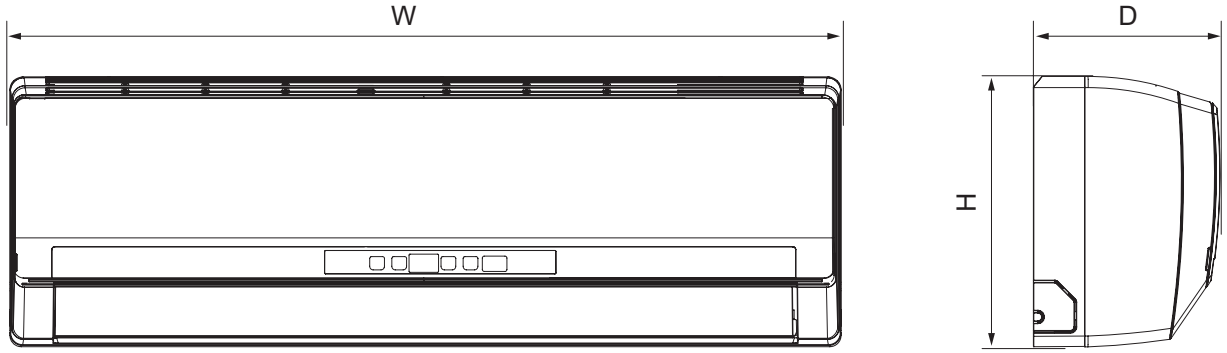
Model		MS-H12AIC PT	MS-18AIC PT
Rated Voltage	V~	220-240	220-240
Rated Frequency	Hz	50	50
Phases		1	1
Cooling Capacity	KW	3.5	5.3
Heating Capacity	KW	3.8	5.8
Air Flow Volume (SH/H/M/L)	m^3/h	630/500/420/350	850/780/650/550
Dehumidifying Volume	L/h	1.4	1.8
Fan Type		Cross-flow	Cross-flow
Fan Diameter-height	mm	Φ92X645	Φ98X710
Fan Motor Speed (SH/H/M/L) Cool	rpm	1260/1070/880/730	1350/1150/1050/900
Fan Motor Speed (SH/H/M/L) Heat	rpm	1280/1080/1000/920	1420/1250/1150/1050
Fan Motor Power Output	W	20	20
Fan motor running current	A	0.22	0.31
Fan Motor Capacitor	μF	1	1.5
Evaporator Material		Aluminum Fin-copper Tube	Aluminum Fin-copper Tube
Evaporator Pipe Diameter	mm	7	7
Evaporator Number of Rows		2	2
Evaporator Fin Pitch	mm	1.4	1.4
Evaporator Length(L)XHeight(H)XWidth(W)	mm	690X267X25.4	715X304.8X25.4
Motor Model		FN20J-PG	FN20V-PG
Overload Protector		3.15	3.15
Motor Full Load Amp(FLA)	A	0.22	0.31
Sound Pressure Level (SH/H/M/L)	dB (A)	38/34/32/30	46/43/40/36
Sound Power Level (SH/H/M/L)	dB (A)	53/49/47/45	61/58/55/51
Outline Dimension (WXHXD)	mm	845X180X275	940X200X298
Package Carton Dimension (LXWXH)	mm	915X255X355	1010X285X380
Package Dimension (LXWXH)	mm	918X258X370	1013X288X395
Net Weight	kg	10	13
Gross Weight	kg	12.5	16
Liquid pipe	mm	Φ6	Φ6
Gas Pipe(to indoor unit)	mm	Φ9.52	Φ12.7
Note: The connection pipe applies metric diameter.			

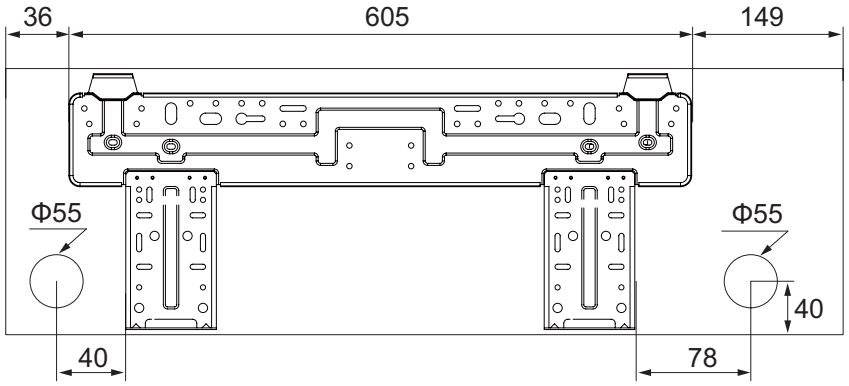
The above data is subject to change without notice; please refer to the nameplate of the unit.

2.2 Noise Criteria Curve Tables for Both Models

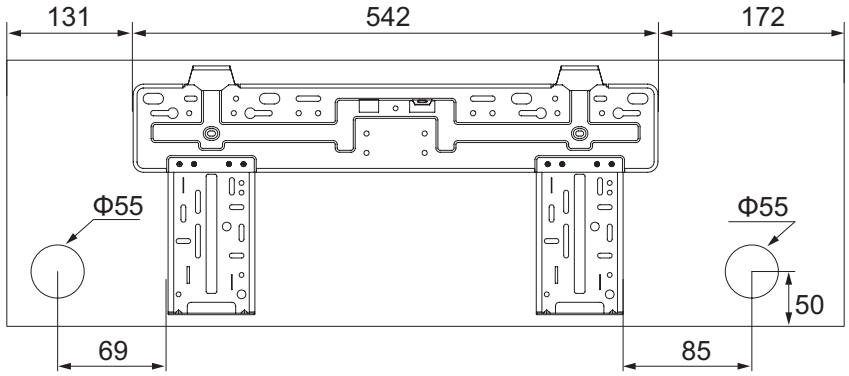


3. Outline Dimension Diagram

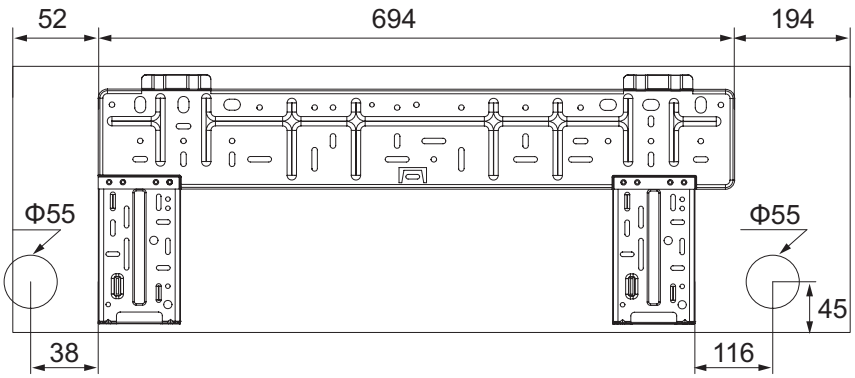




MS-H07AIC PT / MS-H09AIC PT Units



MS-H12AIC PT Units

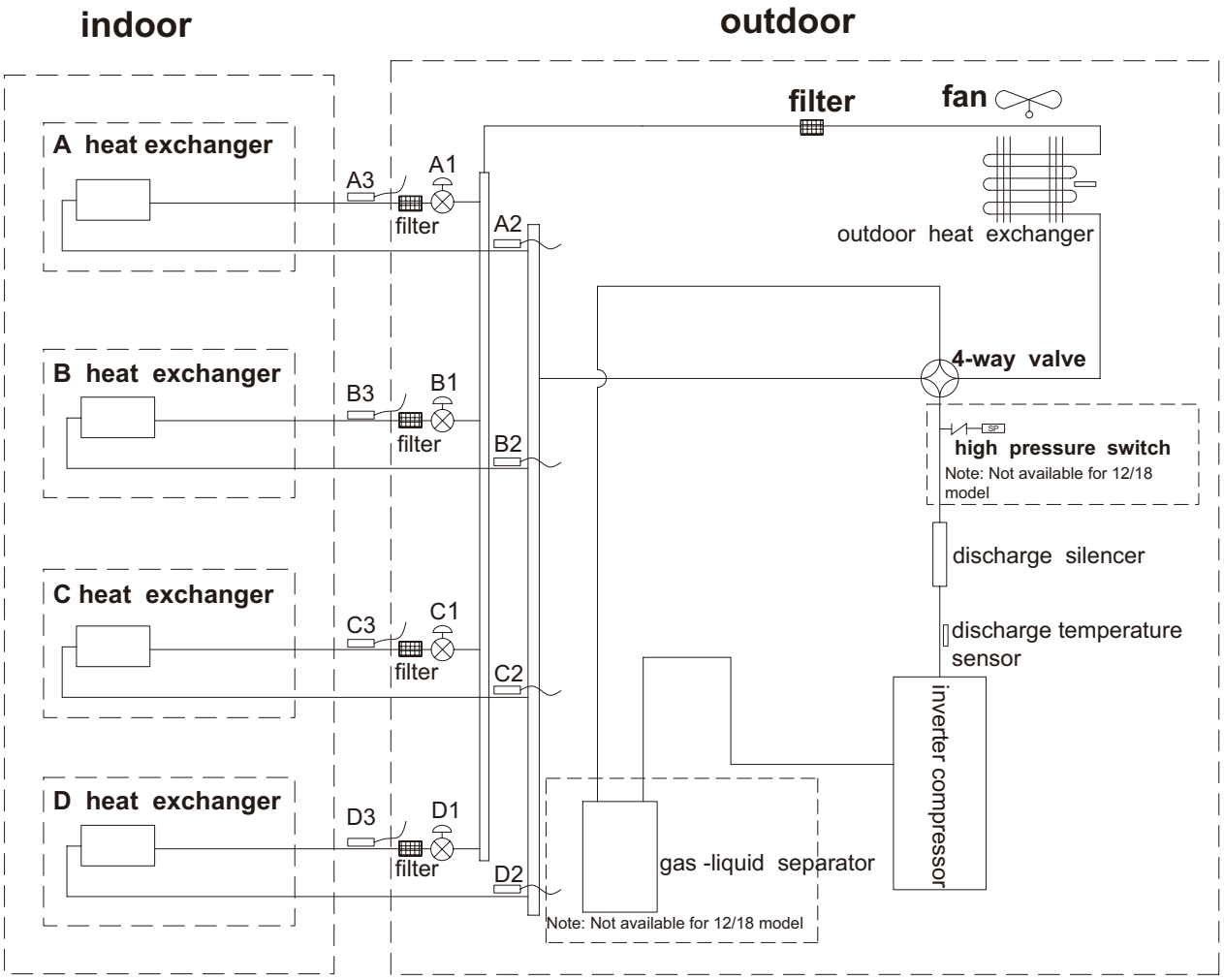


MS-H18AIC PT Units

Unit:mm

Model	W	H	D
07/09	790	265	174
12	845	275	180
18	940	200	298

4. Refrigerant System Diagram



A1:A-unit electronic expansion valve B1:B-unit electronic expansion valve
C1:C-unit electronic expansion valve D1:D-unit electronic expansion valve
A2:A-unit gas pipe temperature sensor B2:B-unit gas pipe temperature sensor
C2:C-unit gas pipe temperature sensor D2:D-unit gas pipe temperature sensor
A3:A-unit liquid pipe temperature sensor B3:B-unit liquid pipe temperature sensor
C3:C-unit liquid pipe temperature sensor D3:D-unit liquid pipe temperature sensor

5. Electrical Part

5.1 Wiring Diagram

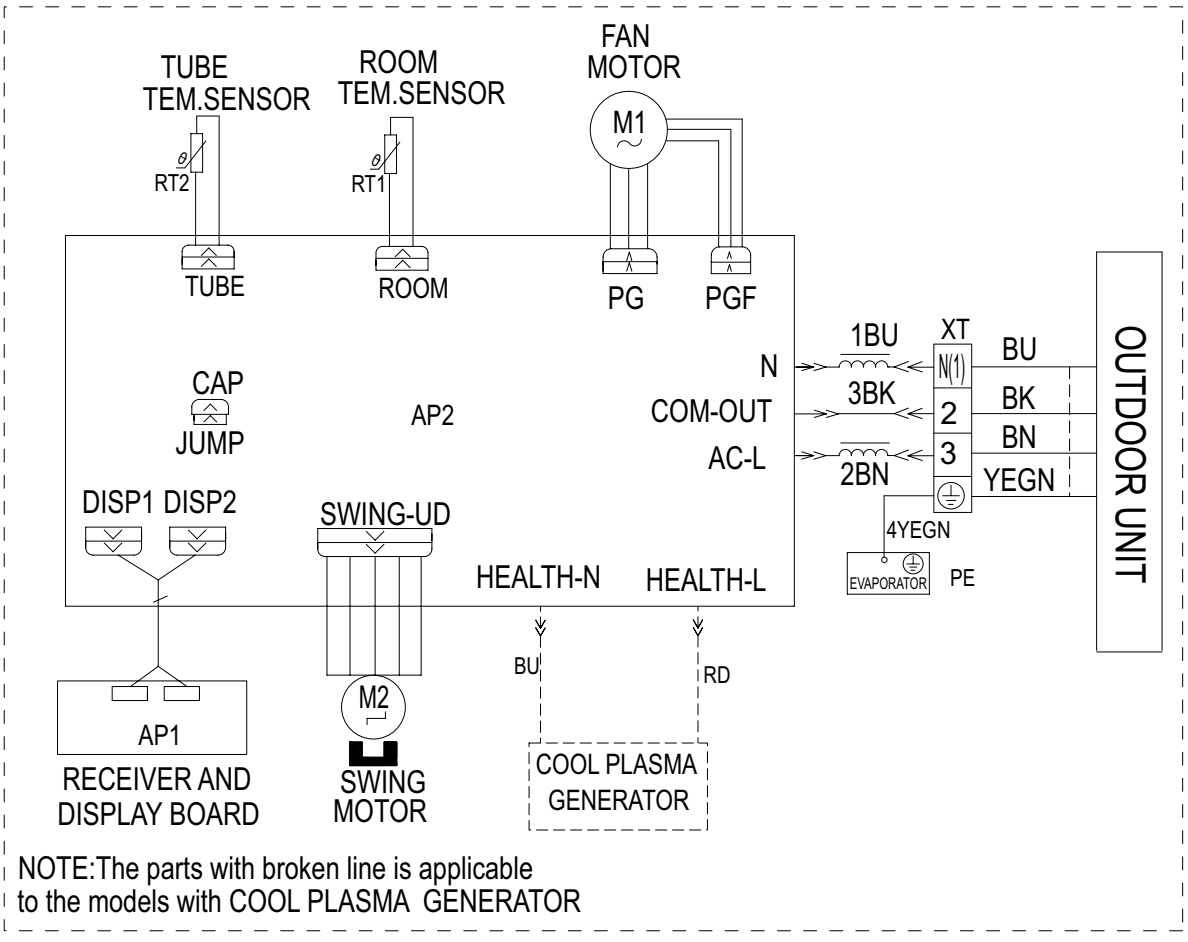
●Instruction

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue	⏚	Grounding wire
YEGN	Yellow/Green	BK	Black	/	/
VT	Violet	OG	Orange	/	/

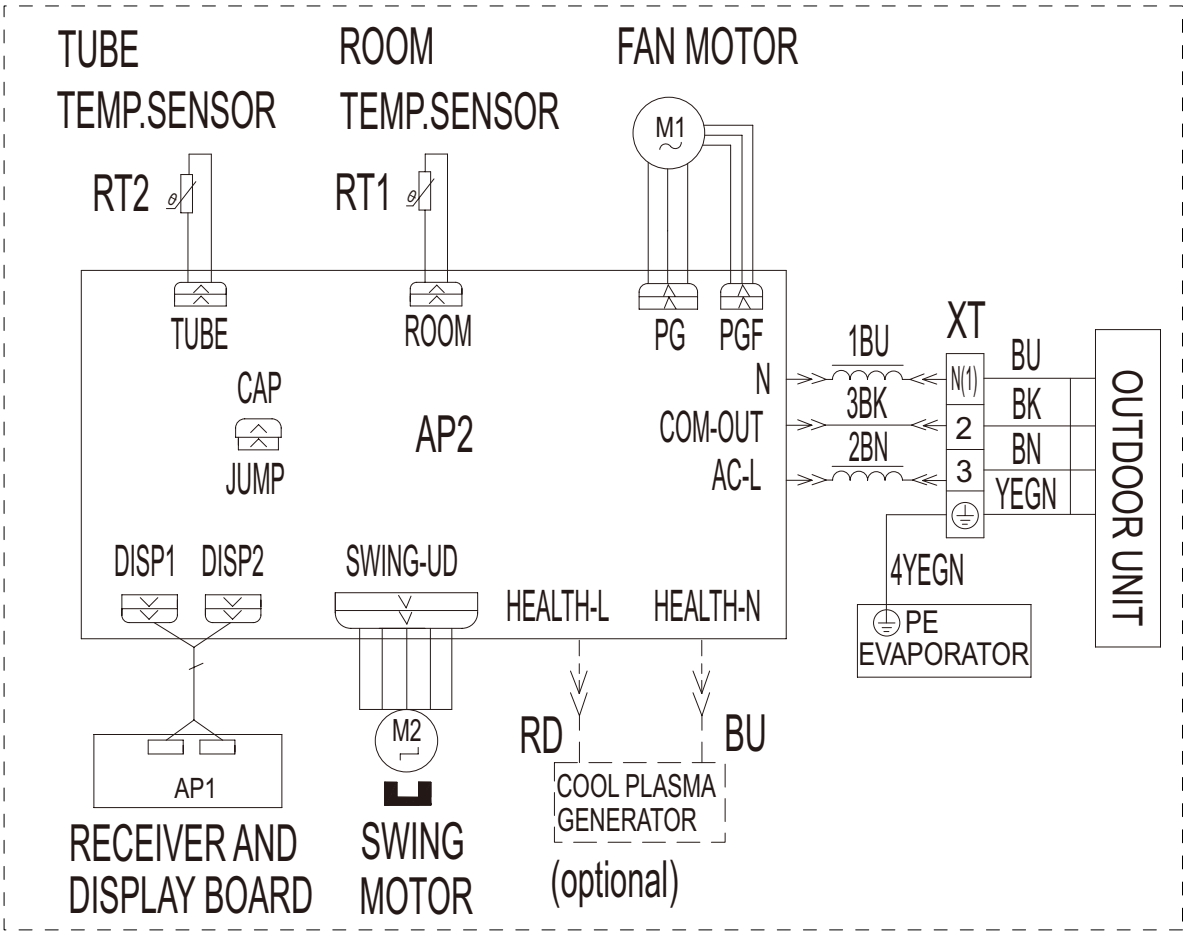
Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

● Indoor Unit

(1) MS-H07AIC PT / MS-H09AIC PT / MS-H12AIC PT Units



(2) MS-H18AIC PT Units

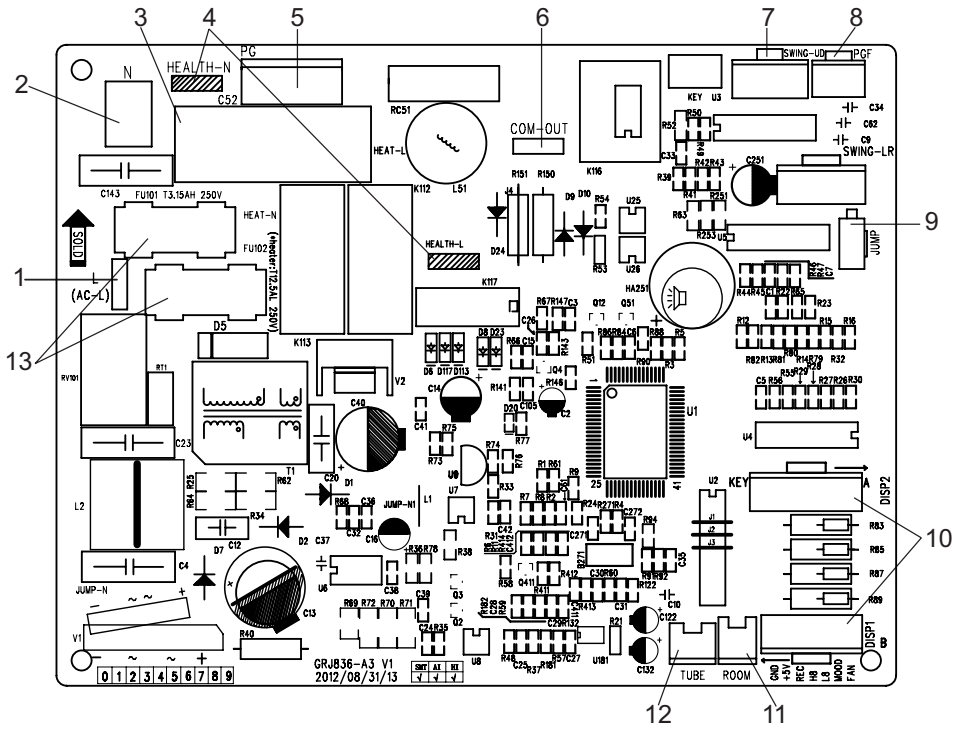


These wiring diagrams are subject to change without notice; please refer to the one supplied with the unit.

5.2 PCB Printed Diagram

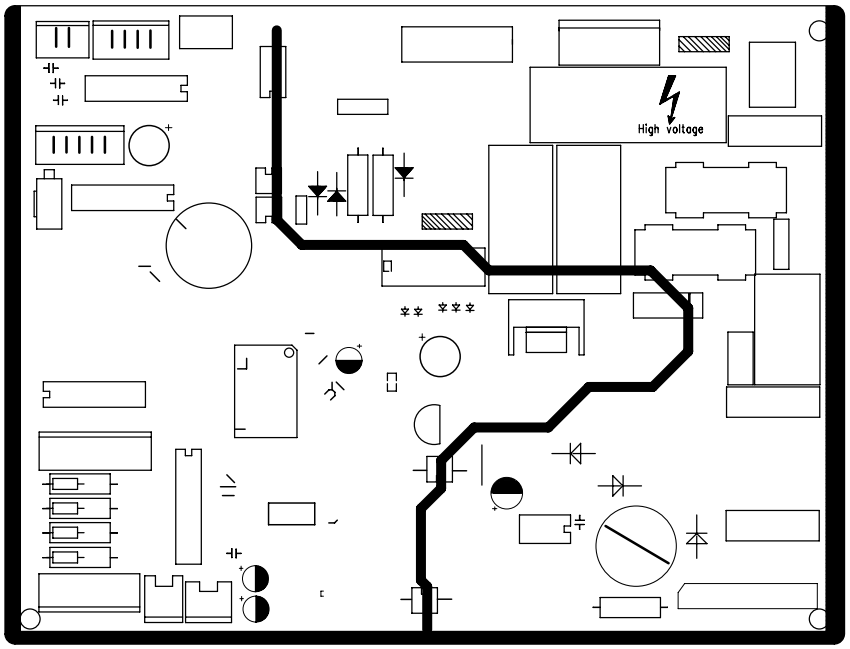
(1) MS-H07AIC PT / MS-H09AIC PT / MS-H12AIC PT Units

● Top view



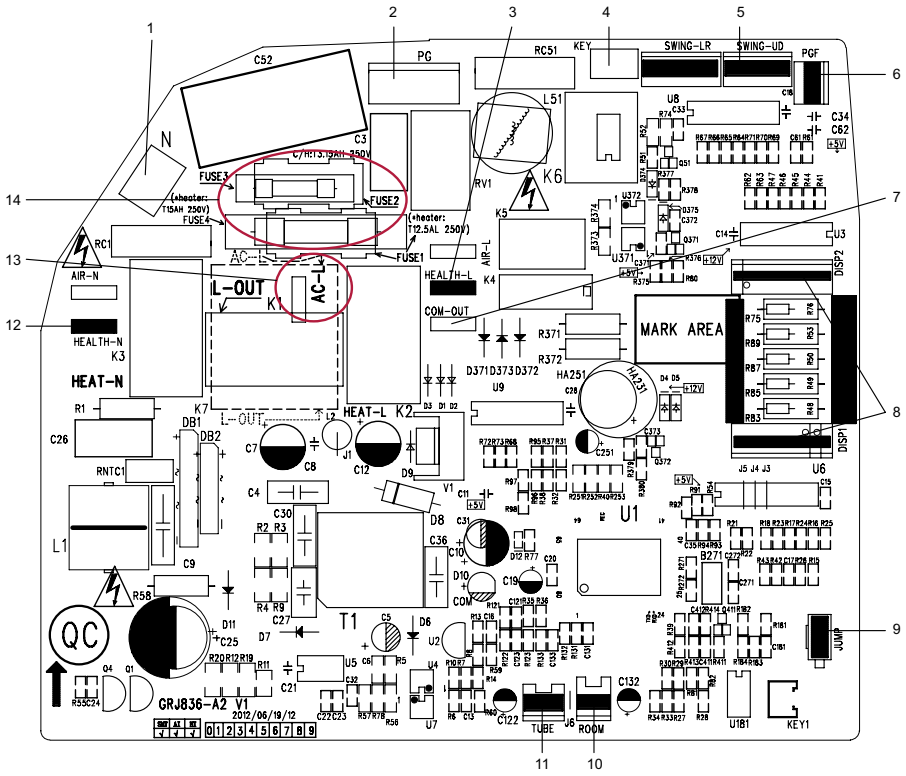
1	Power supply live wire connector
2	Power supply neutral wire connector
3	Fan capacitor
4	Health function terminal (optional)
5	Indoor fan wire terminal
6	Indoor and outdoor unit communication wire terminal
7	Up & down swing control terminal
8	Indoor fan feedback terminal
9	Jumper cap terminal
10	Display panel terminal
11	Indoor ambient temperature sensor
12	Indoor pipe temperature sensor
13	Protective tube

● Bottom view



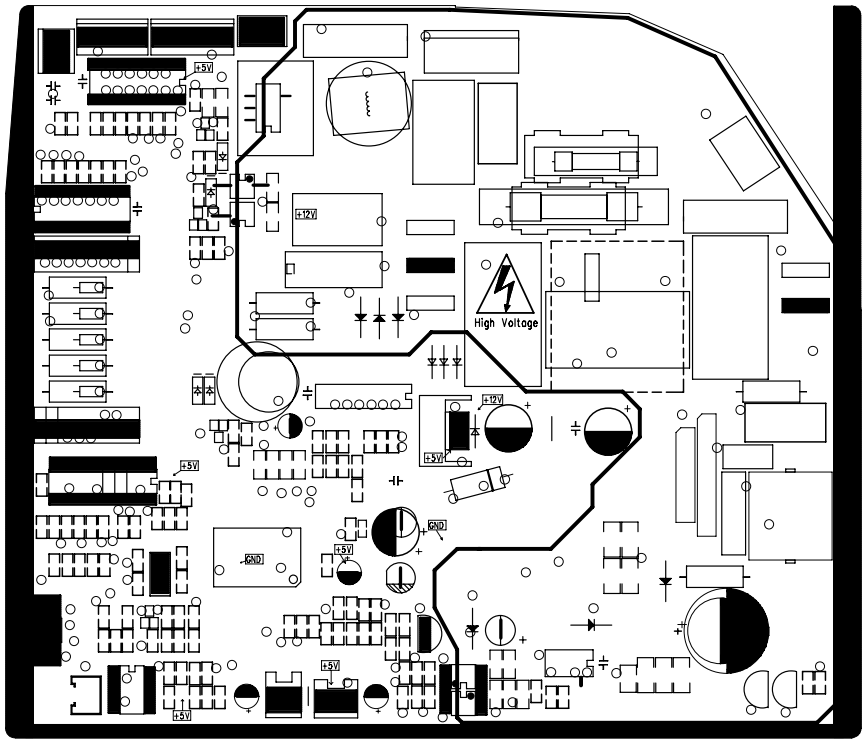
(2) MS-H18AIC PT Units

• Top view



1	Interface of neutral wire
2	Interface of PG motor
3	Interface of health function live wire
4	Interface of auto button
5	Interface of up and down swing
6	Interface of PG feedback
7	Interface of indoor and outdoor unit communication
8	Interface of display
9	Interface of jumper cap
10	Interface of ambient temperature sensor
11	Interface of tube temperature sensor
12	Interface of health function neutral wire
13	Interface of live wire
14	Interface of fuse

• Bottom view



6. Function and Control

6.1 Remote Controller Introduction

1 ON/OFF
Press it to start or stop operation.

2 - :
Press it to decrease temperature setting.

3 +:
Press it to increase temperature setting.

4 FAN
Press it to set fan speed.

5 MODE
Press it to select operation mode (AUTO/COOL/DRY/FAN/HEAT).

6 I FEEL

7
Press it to set HE ALTH function

8
Press it to set AIR function.

9 CLOCK
Press it set clock.

10 TIMER ON
Press it to set auto-on timer.

11
Press it set swing angle.

12 X-FAN (X-FAN is the alternative expression of BLOW for the purpose of understanding.)

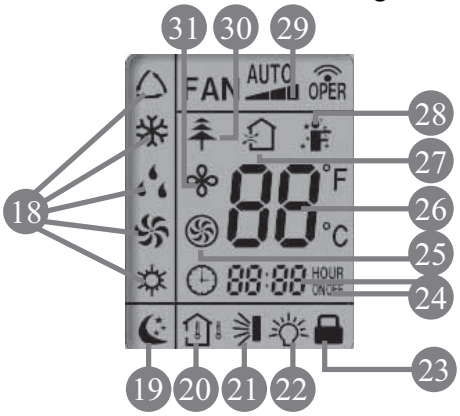
13 TEMP

14 TIMER OFF
Press it to set auto-off timer

15 TURBO

16 SLEEP

17 LIGHT
Press it to turn on/off the light.



18 MODE icon:

If MODE button is pressed, current operation mode icon (AUTO), (COOL), (DRY), (FAN) or (HEAT only for heat pump models) will show.

19 SLEEP icon :

is displayed by pressing the SLEEP button. Press this button again to clear the display.

20 TEMP icon: (" "function is applicable to partial of models.)

Pressing TEMP button, (set temperature), (ambient temperature), (outdoor ambient temperature) and blank is displayed circularly.

21 Up & down swing icon:

is displayed when pressing the up & down swing button. Press this button again to clear the display.

22 LIGHT icon:

is displayed by pressing the LIGHT button. Press LIGHT button again to clear the display.

23 LOCK icon:

is displayed by pressing "+" and "-" buttons simultaneously. Press them again to clear the display.

24 SET TIME display:

After pressing TIMER button, ON or OFF will blink.This area will show the set time.

25 TURBO icon:

is displayed when pressing the TURBO button.Press this button again to clear the display.

26 DIGITAL display:

This area will show the set temperature.During defrosting operation,"H1" will be displayed.

27 AIR icon: (NOTE: This function is applicable to partial of models.)

is displayed when pressing the AIR button.Press this button again to clear the display.

28 I FEEL icon:

is displayed when pressing the I FEEL button. Press this button again to clear the display.

29 FAN SPEED display:

Press FAN button to select the desired fan speed setting (AUTO-Low-Med-High).Your selection will be displayed in the LCD windows, except the AUTO fan speed.

30 HEALTH icon:

is displayed when pressing the HEALTH button. Press this button again to clear the display.

31 X-FAN icon:

is displayed when pressing the X-FAN button. Press this button again to clear the display.

Remote Controller Description

1 ON/OFF:

Press this button to turn on the unit .Press this button again to turn off the unit.

2 -:

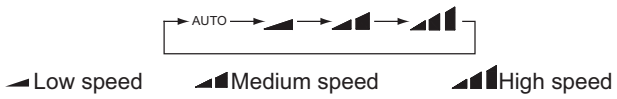
Press this button to decrease set temperature. Hold it down for above 2 seconds to rapidly decrease set temperature. In AUTO mode, set temperature is not adjustable.

3 +:

Press this button to increase set temperature. Hold it down for above 2 seconds to rapidly increase set temperature. In AUTO mode, set temperature is not adjustable.

4 FAN :

This button is used for setting Fan Speed in the sequence that goes from AUTO, , , to then back to Auto.



5 MODE :

Each time you press this button, a mode is selected in a sequence that goes from AUTO,COOL,DRY, FAN,and HEAT *, as the following:

*Note: Only for models with heating function.

After energization, AUTO mode is defaulted. In AUTO mode, the set temperature will not be displayed on the LCD, and the unit will automatically select the suitable operation mode in accordance with the room temperature to make indoor room comfortable.

6 I FEEL:

Press this button to turn on I FEEL function. The unit automatically adjust temperature according to the sensed temperature. Press this button again to cancel I FEEL function.

7

Press this button to set HEALTH function ON or OFF. After the unit is turned on, it defaults to HEALTH function ON.

8 (NOTE: This function is applicable to partial of models.)

Press this button to select AIR function ON or OFF.

9 CLOCK :

Pressing CLOCK button, blinks. Within 5 seconds, pressing + or - button adjusts the present time. Holding down either button above 2 seconds increases or decreases the time by 1 minute every 0.5 second and then by 10 minutes every 0.5 second. During blinking after setting, press CLOCK button again to confirm the setting, and then will be constantly displayed.

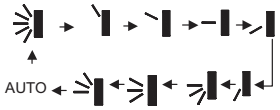
10 TIMER ON :

Press this button to initiate the auto-ON timer. To cancel the auto-timer program, simply press this button again.

After pressing this button, disappears and " ON " blinks . 00:00 is displayed for ON time setting. Within 5 seconds, press + or - button to adjust the time value. Every press of either button changes the time setting by 1 minute. Holding down either button rapidly changes the time setting by 1 minute and then 10 minutes. Within 5 seconds after setting, press TIMER ON button to confirm.

11

Press this button to set up & down swing angle, which circularly changes as below:



This remote controller is universal. If any command , , or is sent out,the unit will carry out the command as

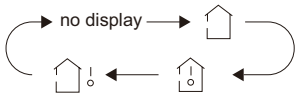
indicates the guide louver swings as:

12 X-FAN:

Pressing X -FAN button in COOL or DRY mode, the icon is displayed and the indoor fan will continue operation for 2 minutes in order to dry the indoor unit even though you have turned off the unit. After energization, X-FAN OFF is defaulted. X-FAN is not available in AUTO, FAN or HEAT mode.

13 TEMP:

Press this button, you can see indoor set temperature, indoor ambient temperature on indoor unit's display. The setting on remote controller is selected circularly as below:



When selecting " " with remote controller or no display, temperature indicator on indoor unit displays set temperature; When selecting " " with remote controller,temperature indicator on indoor unit displays indoor ambient temperature; 3s later or within 3s it receives other remote control signal that will return to display the setting temperature.

Caution:

●This model hasn't outdoor ambient temperature display function. While remote controller can operate " "and indoor unit displays set temperature.

●It's defaulted to display set temperature when turning on the unit.

●Only for the models with temperature indicator on indoor unit.

14 TIMER OFF :

Press this button to initiate the auto-off timer. To cancel the auto-timer program, simply press the button again. TIMER OFF setting is the same as TIMER ON.

15 TURBO:

Press this button to activate/deactivate the Turbo function which enables the unit to reach the preset temperature in the shortest time. In COOL mode, the unit will blow strong cooling air at super high fan speed. In HEAT mode, the unit will blow strong heating air at super high fan speed. (This function is not applicable for some models).

16 SLEEP:

Press this button to go into the SLEEP operation mode. Press it again to cancel this function. This function is available in COOL, HEAT (Only for models with heating function) mode to maintain the most comfortable temperature for you.

17 LIGHT:

Press LIGHT button to turn on the display's light and press this button again to turn off the display's light. If the light is turned on, is displayed. If the light is tunrned off , disappears.

18 Combination of "+" and "-" buttons: About lock

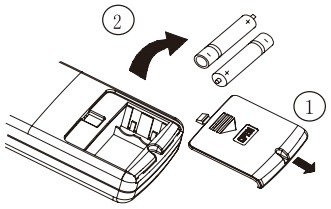
Press "+" and "-" buttons simultaneously to lock or unlock the keypad. If the remote controller is locked, is displayed. In this case, pressing any button, blinks three times.

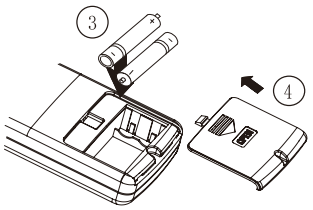
19 Combination of "MODE" and "-" buttons: About switch between Fahrenheit and Centigrade

At unit OFF, press "MODE" and "-" buttons simultaneously to switch between °C and °F.

Replacement of Batteries

1.Remove the battery cover plate from the rear of the remote controller.
(As shown in the figure)
2.Take out the old batteries.
3.Insert two new AAA1.5V dry batteries, and pay attention to the polarity.
4. Reinstall the battery cover plate.





Sketch map for replacing batteries

★Notes:

●When replacing the batteries, do not use old or different types of batteries, otherwise, it may cause malfunction.
●If the remote controller will not be used for a long time, please remove batteries to prevent batteries from leaking.
●The operation should be performed in its receiving range.
●It should be kept 1m away from the TV set or stereo sound sets.
●If the remote controller does not operate normally, please take the batteries out and reinsert them after 30 seconds. If it still can't operate properly,replace the batteries.

6.2 Brief Description of Modes and Functions

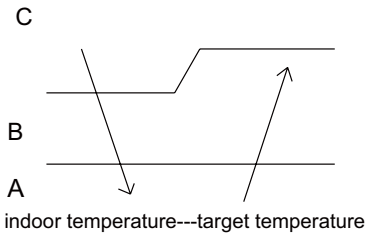
I. Basic Operation Mode

1. Cool; 2.Dry; 3.Heat; 4.Auto; 5.Fan

II. Basic Functions

1.Cooling Only

(1) Under this mode, fan and swing run at preset status, the temperature setting range is 16-30°C.



(2) Under malfunction for outdoor unit and protection stop, the indoor unit runs with the original status, and display malfunction.

(3) The indoor fan stops when the modes conflict with each other.

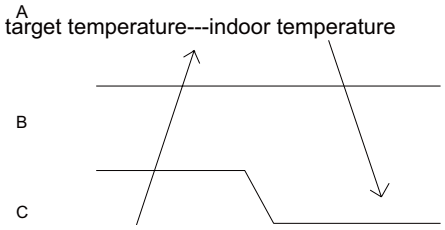
2. Dry Mode

(1) Under this mode, the indoor fan runs with low speed, and swing runs at preset status, the temperature setting range is 16-30°C.

(2) Under malfunction for outdoor unit and protection stop, the indoor unit runs with the original status, and display malfunction.

3. Heating Mode

(1) Under this mode, the temperature setting range is 16-30°C.



(2) Working condition and Process of Heating

When the unit is ON and in heating mode, indoor fan starts cold air prevention operation; when the unit is off and the indoor fan stopped before, it blows residual heat.

(3) Protection Function. The compressor stops as the malfunction (including any temperature sensor malfunction) in heating mode, the indoor fan runs with blowing residual heat.

(4) Defrosting and Oil Return

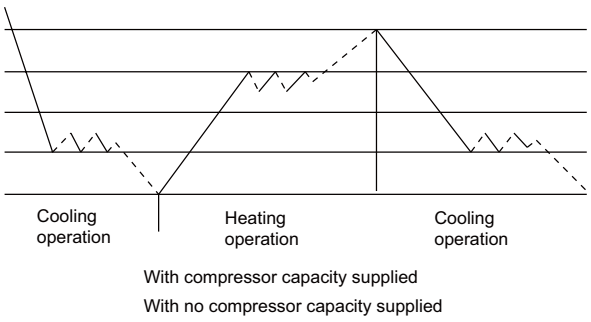
Once defrosting signal of outdoor unit is received, Heating indicator on indoor unit OFF 0.5s and ON 10s.

4. Working Methods of Auto Mode

1) When Tamb.≥26°C, it operates in Cool mode.

2) For heat pump unit, when Tamb.≤22°C, it operates in Heat mode.

3) When 22°C< Tamb.< 26°C, it operates in auto fan mode upon initial startup of the unit. When changing to auto mode from other modes, it will keep the previous operation mode (when it enter Dry mode, it operates in auto fan mode.).



5. Fan Mode

Only indoor fan operates in Fan mode. Under auto fan speed, it runs in cooling auto fan mode.

III. Other Control

1. Buzzer

The buzzer will give out a beep when the controller is energized, receiving signal from remote controller and auto button.

2. Auto Button

Press this button once, it will operate in Auto mode, and indoor fan operates in Auto fan mode and swing. When the unit is on, pressing this button will turn off the unit.

3. Auto Fan

a. Auto fan speed under heating mode

When Tinddor amb. ≤Tpreset+1°C, indoor fan operates at high speed;

When Tpreset+1°C<T inddor amb.<Tpreset+3°C, indoor fan operates at medium speed;

When T inddor amb.≥Tpreset+3°C, indoor fan operates at low speed.

b. Auto fan speed under cooling or fan mode

WhenT amb.≥Tpreset+3°C, indoor fan operates at high speed;

When Tpreset+1<T amb.<Tpreset+3°C, indoor fan operates at medium speed;

WhenT amb.≤Tpreset+1°C, indoor fan operates at low speed.

c. Auto fan speed under drying mode is low speed.

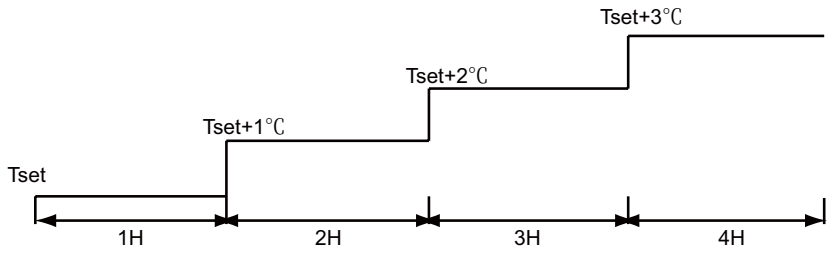
During auto fan speed, there's should be at least 3min and 30s operation time when switching between high speed, medium speed and low speed.

Note: Under auto fan speed, it will shift between high speed and middle speed, middle speed and low speed, high speed and low speed, the operation time must be 3.5min at least.

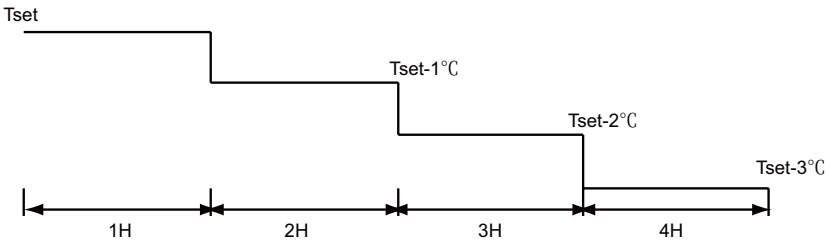
4. Sleep

4.1 The unit will select suitable sleep curve according to set temperature.

4.2 Sleep curve in Heat mode



4.3 Sleep curve in Cool mode



5. Timer Function

(1) General Timer:

1.1 Time On: if Timer On is set when the system is,the controller will operate in the original setting mode after reaching the timer on time. The timer interval is 0.5h, and the setting range is 0.5-24h.

1.2 Timer Off: Timer Off can be set when the unit is on. The unit will be off when timer off time is reahced. The timer interval is 0.5h, and the setting range is 0.5-24h.

(2) Clock Timer:

2.1 Timer On: If Timer On is set when the system runs, it will continue to run; if Timer On is set when the system is off, the system will start to run in the original setting mode when timer on time is reached.

2.2 Timer Off: If timer off is set when the system is off, the system keeps stand-by status; if timer off is set when the system is on, the system stops when reaching timer off time.

2.3 Timer Change:Timer On and Timer OFF can be set via remote ON/OFF button. Timer time can be reset and the system will operate according to the latest setting.

When the unit is on and Timer On and Timer Off are both set, the system will operate according to the set state. When the timer off time is reached, the system will stop.

When the system stops, and Timer On and Timer Off are both set, the system will remain stop until timer on time is reached. After that, the unit will operate according to the set mode everyday when the timer on time is reached. When the timer off time is reached, the system will stop. If timer on time is the same as timer off time, the system will stop.

6. Memory Function

Memory contents: mode, up& down swing, light, set temperature, set fan speed, general timer (but clock timer). After power failure, if the unit is reenergized, it will operate according to memory contents. If Timer function is not set in the last remote control, the system will operate according to the last remote control.
If general timer function is set in the last remote control and power failure occurs before timer time is reached, the unit will operate according to the timer function set in the last remote control. Timer time is calculated after the unit is re-energized.
If general timer function is set in the last remote control and power failure occurs after timer time is reached, the system will operate according to the memory content before power failure. Timer operation is not memorized.

7. HEALTH Function

When the unit is on and the indoor fan operates, press HEALTH button to start this function (if there is no HEALTH button, HEALTH operation is defaulted). When indoor fan stops or turning of HEALTH function by remote controller, HEALTH function will be off.

8. I Feel Function

When the controller receives I Feel order, the controller will operate according to the ambient temperature. The remote controller will send ambient temperature to the controller every 10min. If the controller does not receive the ambient temperature sent by remote controller for 11min, the air conditioner will operate according the ambient temperature around it. If I Feel function is not set, the air conditioner will operate according the ambient temperature around it. This function is not memorized upon power r failure.

9. Reserved Fahrenheit Temperature

The nixie tube will display the set temperature in Celsius temperature or Fahrenheit Temperature according to the order. Setting range is 16~30°C. In Auto mode, it will display 25°C during cooling and fan operation, and display 20°C during heating operation. For cooling only unit, it displays 25°C.
The indoor temperature displayed is sent by remote controller, ranging from 0~60°C. If outdoor ambient temperature is received, the display remains the same. If valid control signal is received, it will display set temperature for 5s and then resume displaying ambient temperature.
For units with memory function, set temperature will be displayed after re-energizing the unit.

10. Cold Plasma Function(optional)

Turning on the cold plasma function with remote controller when the fan operates, this function will act.
Turning off the cold plasma function with remote controller or turning off the fan, this function will end.

11. Turbo Function

When Turbo command is received by controller, indoor fan will operate at high speed while outdoor unit will operate at high frequency in cooling or heating mode.

12. Forcible Defrosting Function

When the unit is in Heat mode and set temperature is 16°C, press “+, -, +, -, +, -,” successively for 5s, and the indoor unit will enter forcible defrosting setting and send the signal to the outdoor unit.
When the indoor unit receives forcible defrosting signal from the outdoor unit, it will exit forcible defrosting setting.

13. Refrigerant Recovery Function

Enter refrigerant recovery mode: turn on the unit within 5 min after energization and at 16°C cooling mode. Press remote controller light off button successively for 3 times within 3s and the unit will enter refrigerant recovery mode, displaying Fo. The signal will be sent to the outdoor unit.
Exit refrigerant recovery mode: during refrigerant recovery, if any signal from remote controller is received or refrigerant recovery lasts for 25min, it will exit this mode.
Action of entering refrigerant recovery mode: the indoor fan will operate in Cool mode. The fan speed is high and set temperature is 16°C. The horizontal louver will be at the smallest angle.
Action of exit refrigerant recovery mode: the indoor fan will operate according to the last remote control setting.

14. Mode Conflict

When the mode of started unit is different from that of operating unit, the indoor unit will display mode conflict code “E7”. The mode sent to the outdoor unit remains the one received by the remote controller.

Part Ⅱ : Installation and Maintenance

7. Notes for Installation and Maintenance

Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.
The following contents are very important for installation and maintenance.

Please follow the instructions below.

●The installation or maintenance must accord with the instructions.
●Comply with all national electrical codes and local electrical codes.
●Pay attention to the warnings and cautions in this manual.
●All installation and maintenance shall be performed by distributor or qualified person.
●All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.
●Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.

Warnings

Electrical Safety Precautions:

1. Cut off the power supply of air conditioner before checking and maintenance.
2. The air condition must apply specialized circuit and prohibit share the same circuit with other appliances.
3. The air conditioner should be installed in suitable location and ensure the power plug is touchable.
4. Make sure each wiring terminal is connected firmly during installation and maintenance.
5. Have the unit adequately grounded. The grounding wire can't be used for other purposes.
6. Must apply protective accessories such as protective boards, cable-cross loop and wire clip.
7. The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.
8. The power cord and power connection wires can't be pressed by hard objects.
9. If power cord or connection wire is broken, it must be replaced by a qualified person.
10. If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.
11. For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.
12. Make sure all wires and pipes are connected properly and the valves are opened before energizing.
13. Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.
14. Replace the fuse with a new one of the same specification if it is burnt down; don't replace it with a cooper wire or conducting wire.
15. If the unit is to be installed in a humid place, the circuit breaker must be installed.

Installation Safety Precautions:

1. Select the installation location according to the requirement of this manual.(See the requirements in installation part)
2. Handle unit transportation with care; the unit should not be carried by only one person if it is more than 20kg.
3. When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed; make sure the installation support is firm.
4. Ware safety belt if the height of working is above 2m.
5. Use equipped components or appointed components during installation.
6. Make sure no foreign objects are left in the unit after finishing installation.

Refrigerant Safety Precautions:

1. Avoid contact between refrigerant and fire as it generates poisonous gas; Prohibit prolong the connection pipe by welding.
2. Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture or other hazards.
3. Make sure no refrigerant gas is leaking out when installation is completed.
4. If there is refrigerant leakage, please take sufficient measure to minimize the density of refrigerant.
5. Never touch the refrigerant piping or compressor without wearing glove to avoid scald or frostbite.

Improper installation may lead to fire hazard, explosion, electric shock or injury.

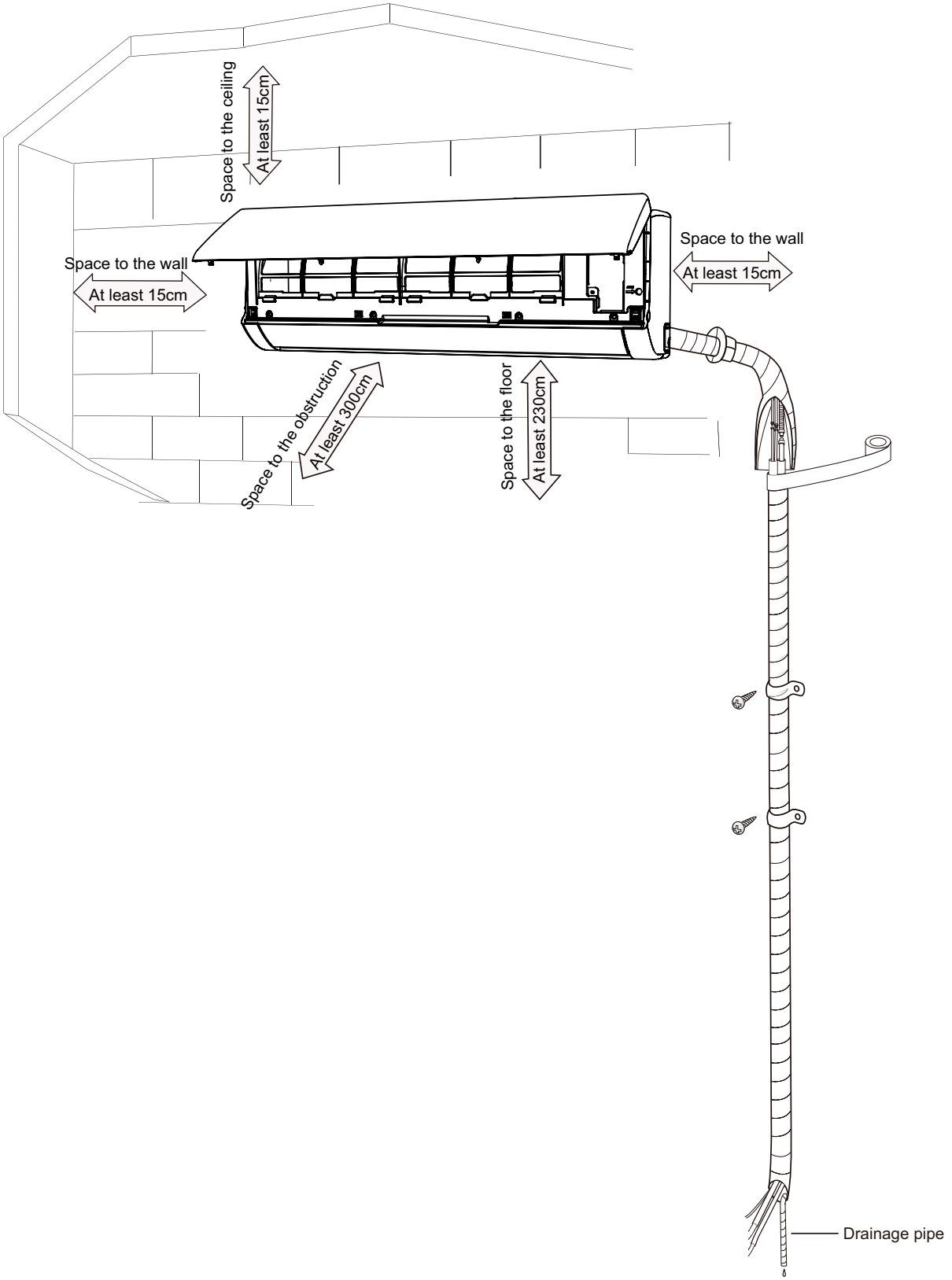
Main Tools for Installation and Maintenance

1. Level meter, measuring tape 	**2. Screw driver** 	**3. Impact drill, drill head, electric drill**
4. Electroprobe 	**5. Universal meter** 	**6. Torque wrench, open-end wrench, inner hexagon spanner**
7. Electronic leakage detector 	**8. Vacuum pump** 	**9. Pressure meter**
10. Pipe pliers, pipe cutter 	**11. Pipe expander, pipe bender** 	**12. Soldering appliance, refrigerant container**

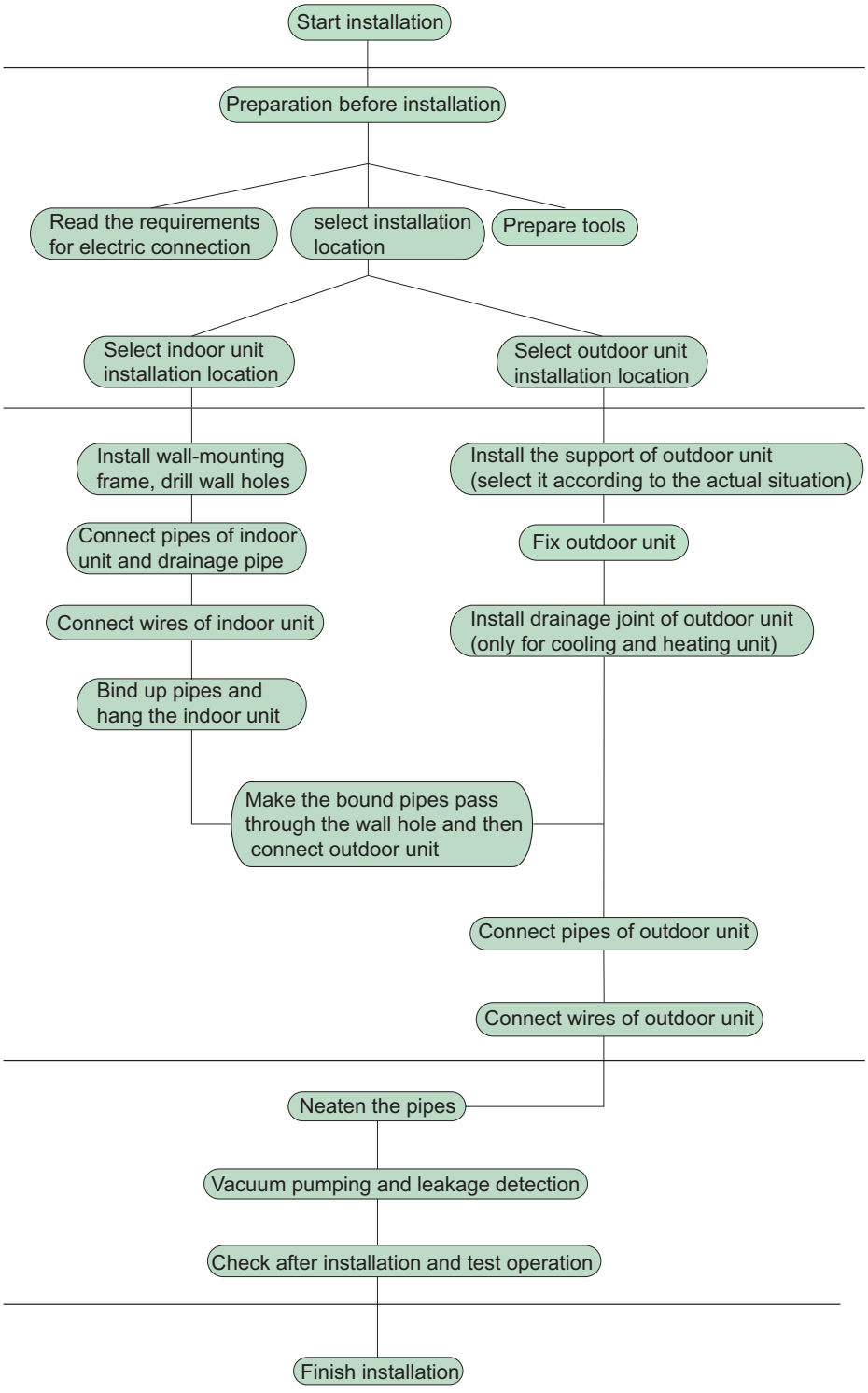
8. Installation

8.1 Installation Dimension Diagram

Installation dimension diagram



Installation procedures


Start installation
Preparation before installation
Read the requirements for electric connection
select installation location
Prepare tools
Select indoor unit installation location
Select outdoor unit installation location
Install wall-mounting frame, drill wall holes
Install the support of outdoor unit (select it according to the actual situation)
Connect pipes of indoor unit and drainage pipe
Fix outdoor unit
Connect wires of indoor unit
Install drainage joint of outdoor unit (only for cooling and heating unit)
Bind up pipes and hang the indoor unit
Make the bound pipes pass through the wall hole and then connect outdoor unit
Connect pipes of outdoor unit
Connect wires of outdoor unit
Neaten the pipes
Vacuum pumping and leakage detection
Check after installation and test operation
Finish installation

Note: this flow is only for reference; please find the more detailed installation steps in this section.

8.2 Installation Parts-checking

No.	Name	No.	Name
1	Indoor unit	8	Sealing gum
2	Outdoor unit	9	Wrapping tape
3	Connection pipe	10	Support of outdoor unit
4	Drainage pipe	11	Fixing screw
5	Wall-mounting frame	12	Drainage plug(cooling and heating unit)
6	Connecting cable(power cord)	13	Owner's manual, remote controller
7	Wall pipe		

⚠ **Note:**
1.Please contact the local agent for installation.
2.Don't use unqualified power cord.

8.3 Selection of Installation Location

1. Basic Requirement:
Installing the unit in the following places may cause malfunction. If it is unavoidable, please consult the local dealer:
(1) The place with strong heat sources, vapors, flammable or explosive gas, or volatile objects spread in the air.
(2) The place with high-frequency devices (such as welding machine, medical equipment).
(3) The place near coast area.
(4) The place with oil or fumes in the air. in the air.
(5) The place with sulfureted gas.
(6) Other places with special circumstances.

2. Indoor Unit:
(1) There should be no obstruction near air inlet and air outlet.
(2) Select a location where the condensation water can be dispersed easily and won't affect other people.
(3) Select a location which is convenient to connect the outdoor unit and near the power socket.
(4) Select a location which is out of reach for children.
(5) The location should be able to withstand the weight of indoor unit and won't increase noise and vibration.
(6) The height of indoor unit should be between 230-260cm from the floor in order to provide sufficient space for maintenance.
(7) Don't install the indoor unit right above the electric appliance.
(8) The appliance shall not be installed in the laundry

8.4 Requirements Forelectric Connection

1. Safety precaution
(1) Must follow the electric safety regulations when installing the unit.
(2) According to the local safety regulations, use qualified power supply circuit and air switch.
(3) Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock,fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.
(4) Properly connect the live wire, neutral wire and grounding wire of power socket.
(5) Be sure to cut off the power supply before proceeding any work related to electricity and safety.
(6) Do not put through the power before finishing installation.
(7) For appliances with type Y attachment,the instructions shall contain the substance of thefollowing.If the supply cord is damaged,it must be replaced by the manufacturer,its service agent or similarly qualified persons in order to avoid a hazard.
(8) The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.

2. Grounding requirement:
(1) The air conditioner is first class electric appliance. It must be properly grounding with specialized grounding device by a professional. Please make sure it is always grounded effectively, otherwise it may cause electric shock.
(2) The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
(3) The grounding resistance should comply with national electric safety regulations.
(4) The appliance must be positioned so that the plug is accessible
(5) An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.
(6) Including an air switch with suitable capacity, please note the following table. Air switch should be included magnet buckle and heating buckle function, it can protect the circuit-short and overload. (Caution: please do not use the fuse only for protect the circuit)

8.5 Installation of Indoor Unit

1. Choosing Installation location
Recommend the installation location to the client and then confirm it with the client.

2. Install Wall-mounting Frame
(1) Hang the wall-mounting frame on the wall; adjust it in horizontal position with the level meter and then point out the screw fixing holes on the wall.
(2) Drill the screw fixing holes on the wall with impact drill (the specification of drill head should be the same as the plastic expansion particle) and then fill the plastic expansion particles in the holes.
(3) Fix the wall-mounting frame on the wall with tapping screws (ST4.2X25TA) and then check if the frame is firmly installed by pulling the frame. If the plastic expansion particle is loose, please drill another fixing hole nearby.

3. Install Wall-mounting Frame

(1) Choose the position of piping hole according to the direction of outlet pipe. The position of piping hole should be a little lower than the wall-mounted frame.(As show in Fig.1)

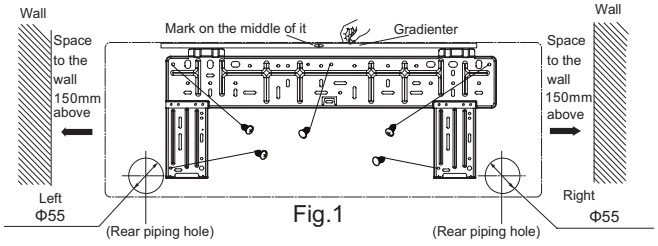


Fig.1

(2) Open a piping hole with the diameter of Φ55 or Φ70 on the selected outlet pipe position.In order to drain smoothly, slant the piping hole on the wall slightly downward to the outdoor side with the gradient of 5-10°.(As show in Fig.2)

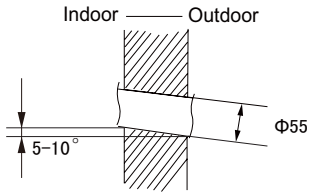


Fig.2

⚠ **Note:**

(1) Pay attention to dust prevention and take relevant safety measures when opening the
hole.

(2) The plastic expansion particles are not provided and should be bought locally.

4. Outlet pipe

(1) The pipe can be led out in the direction of right, rear right, left or rear left.(As show in Fig.3)

(2) When selecting leading out the pipe from left or right, please cut off the corresponding hole on the bottom case.(As show in Fig.4)

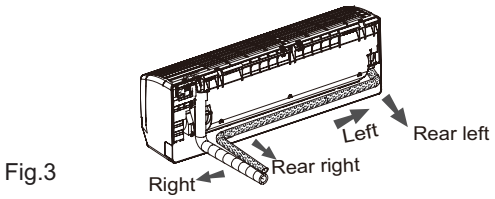


Fig.3

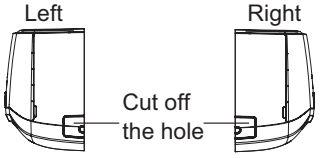


Fig.4

5. Connect the Pipe of Indoor Unit

(1) Aim the pipe joint at the corresponding bellmouth.(As show in Fig.5)

(2) Pretightening the union nut with hand.

(3) Adjust the torque force by referring to the following sheet. Place the open-end wrench on the pipe joint and place the torque wrench on the union nut. Tighten the union nut with torque wrench.(As show in Fig.6)

(4) Wrap the indoor pipe and joint of connection pipe with insulating pipe, and then wrap it with tape.(As show in Fig.7)

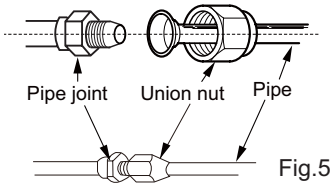


Fig.5

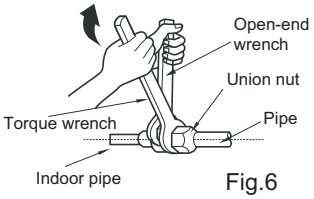


Fig.6

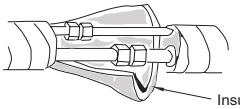


Fig.7

Refer to the following table for wrench moment of force:

Hex nut diameter(mm)	Tightening torque(N.m)
Φ6	15~20
Φ9.52	30~40
Φ12	45~55
Φ16	60~65
Φ19	70~75

6. Install Drain Hose

(1) Connect the drain hose to the outlet pipe of indoor unit.(As show in Fig.8)

(2) Bind the joint with tape.(As show in Fig.9)

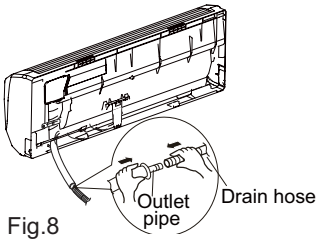


Fig.8

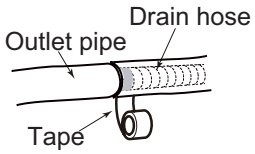


Fig.9

⚠ **Note:**

(1) Add insulating pipe in the indoor drain hose in order to prevent condensation.

(2) The plastic expansion particles are not provided.
(As show in Fig.10)

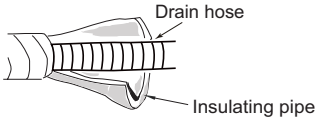


Fig.10

7. Connect Wire of Indoor Unit

(1) Open the panel, remove the screw on the wiring cover and then take down the cover.(As show in Fig.11)

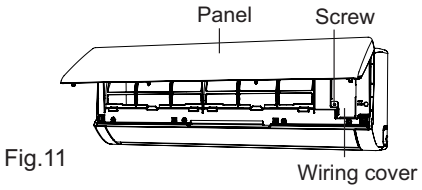


Fig.11

(2) Make the power connection wire go through the cable-cross hole at the back of indoor unit and then pull it out from the front side.(As show in Fig.12)

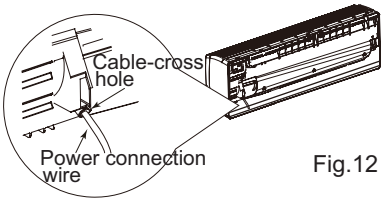


Fig.12

(3) Remove the wire clip; connect the power connection wiresignal control wire(only for cooling and heating unit) to the wiring terminal according to the color; tighten the screw and then fix the power connection wire with wire clip.(As show in Fig.13)

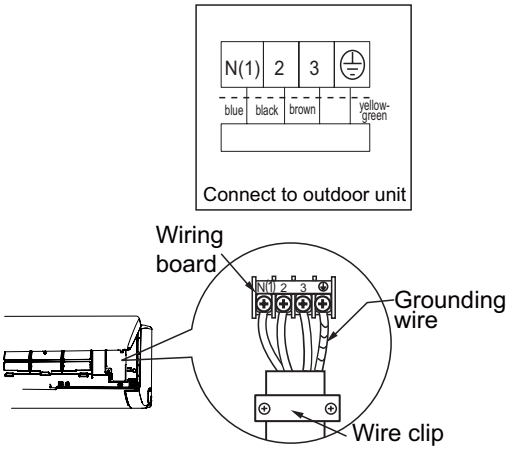


Fig.13

(4) Put wiring cover back and then tighten the screw.

(5) Close the panel.

⚠ **Note:**

(1) All wires of indoor unit and outdoor unit should be connected by a professional.

(2) If the length of power connection wire is insufficient, please contact the supplier for a new one. Avoid extending the wire by yourself.

(3) For the air conditioner with plug, the plug should be reachable after finishing installation.

(4) For the air conditioner without plug, an air switch must be installed in the line. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.

8. Bind up Pipe

(1) Bind up the connection pipe, power cord and drain hose with the band.(As show in Fig.14)

(2) Reserve a certain length of drain hose and power cord for installation when binding them. When binding to a certain degree, separate the indoor power and then separate the drain hose.(As show in Fig.15)

(3) Bind them evenly.

(4) The liquid pipe and gas pipe should be bound separately at the end.

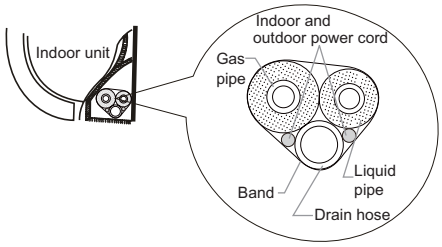


Fig.14

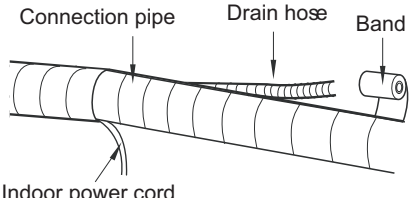


Fig.15

⚠ **Note:**

(1) The power cord and control wire can't be crossed or winding.

(2) The drain hose should be bound at the bottom.

9. Hang the Indoor Unit

(1) Put the bound pipes in the wall pipe and then make them pass through the wall hole.

(2) Hang the indoor unit on the wall-mounting frame.

(3) Stuff the gap between pipes and wall hole with sealing gum.

(4) Fix the wall pipe.

(As show in Fig.16)

(5) Check if the indoor unit is installed firmly and closed to the wall.(As show in Fig.17)

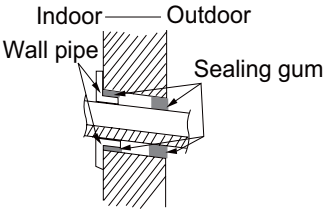
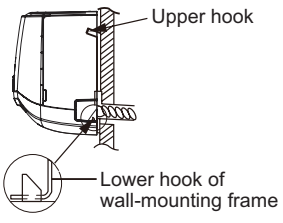


Fig.16

Fig.17



⚠ **Note:**

Do not bend the drain hose too excessively in order to prevent blocking.

8.6 Check after Installation and Test Operation

1. Check after Installation

Check according to the following requirement after finishing installation.

NO.	Items to be checked	Possible malfunction
1	Has the unit been installed firmly?	The unit may drop, shake or emit noise.
2	Have you done the refrigerant leakage test?	It may cause insufficient cooling (heating) capacity.
3	Is heat insulation of pipeline sufficient?	It may cause condensation and water dripping.
4	Is water drained well?	It may cause condensation and water dripping.
5	Is the voltage of power supply according to the voltage marked on the nameplate?	It may cause malfunction or damage the parts.
6	Is electric wiring and pipeline installed correctly?	It may cause malfunction or damage the parts.
7	Is the unit grounded securely?	It may cause electric leakage.
8	Does the power cord follow the specification?	It may cause malfunction or damage the parts.
9	Is there any obstruction in air inlet and air outlet?	It may cause insufficient cooling (heating).
10	The dust and sundries caused during installation are removed?	It may cause malfunction or damaging the parts.
11	The gas valve and liquid valve of connection pipe are open completely?	It may cause insufficient cooling (heating) capacity.

2. Test operation

(1) Preparation of test operation

● The client approves the air conditioner installation.

● Specify the important notes for air conditioner to the client.

(2) Method of test operation

● Put through the power, press ON/OFF button on the remote controller to start operation.

● Press MODE button to select AUTO, COOL, DRY, FAN and HEAT to check whether the operation is normal or not.

● If the ambient temperature is lower than 16℃ , the air conditioner can't start cooling.

9. Maintenance

9.1 Error Code

1. Malfunction display requirement

When there are several malfunctions, they will be displayed circularly.

2. Malfunction display method

(1) Hardware malfunction: immediate display; refer to “error code list”;

(2) Operation state: immediate display; refer to “error code list”;

(3) Other malfunctions: it is displayed after the compressor stops for 200s; refer to “error code list”.

Note: when the compressor is restarted, the malfunction display delay time (200s) is cleared.

3. Malfunction display control

The indicator lamp and dual 8 nixie tube displays shall be synchronized. That is when the indicator lamp blinks, the dual 8 nixie tube displays the corresponding malfunction code.

4. Display control viaremote controller

Enter display control: press light button successively for 6 times within 3s to display the corresponding malfunction code;

Exit display control: pressing light button successively for 6 times within 3s or after display is shown for 5min, the display will terminate.

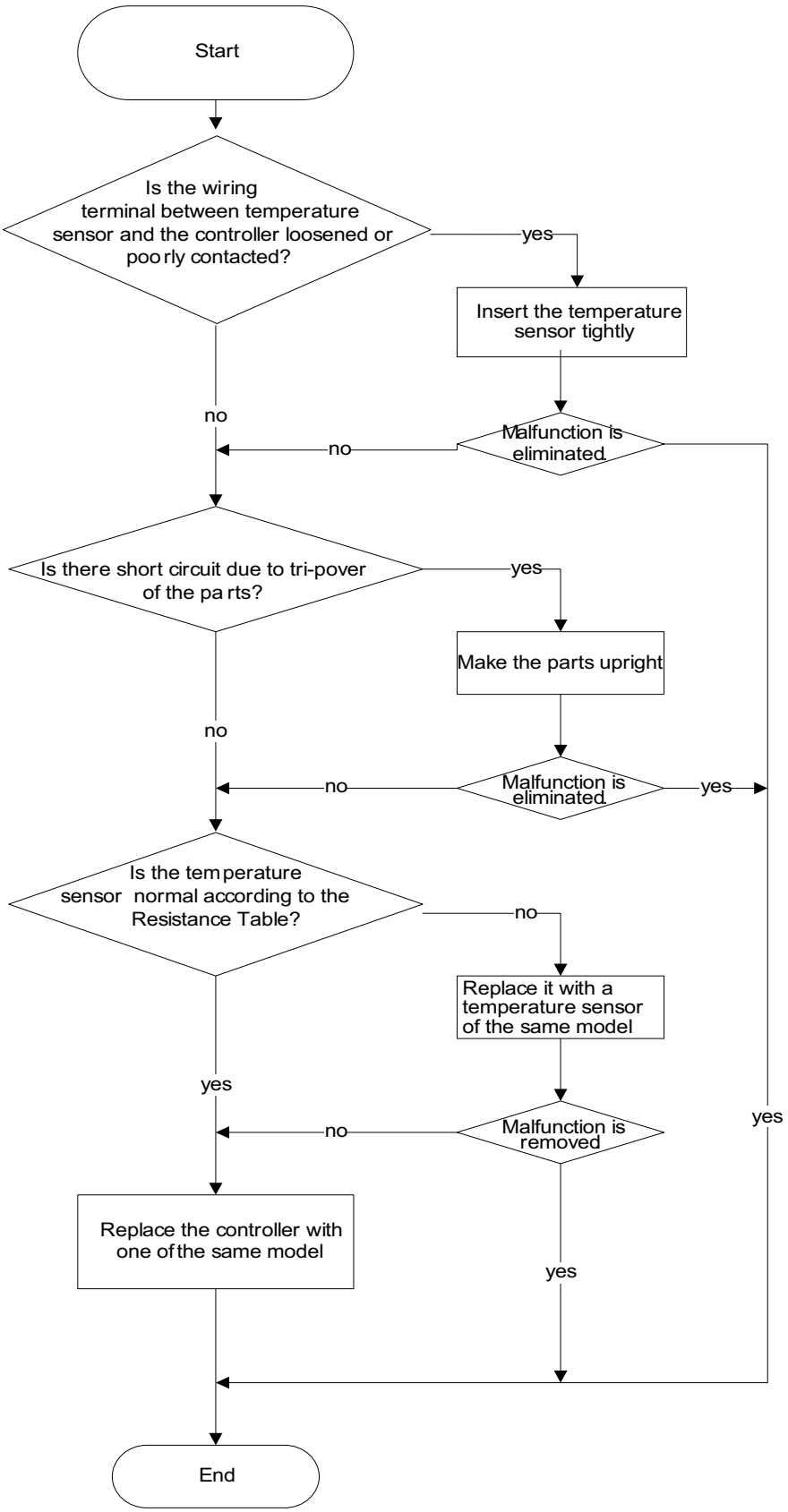
Error Code List

Malfunction Name	Malfunction types	Dual-8 Nixie Tube	Indicator Display		
			Operation indicator	Cooling indicator	Heating indicator
Fault in input power zero	Hardware malfunction	U8	blink 17 times		
Jumper cap malfunction protection	Hardware malfunction	C5	blink 15 times		
No feedback of indoor fan motor	Hardware malfunction	H6	blink 11 times		
Indoor ambient sensor open or short circuit	Hardware malfunction	F1		blink once	
Indoor tube sensor open or short circuit	Hardware malfunction	F2		blink twice	
Inlet tube sensor malfunction	Hardware malfunction	b5		blink 19 times	
Outlet tube sensor malfunction	Hardware malfunction	b7		blink 22 times	
IPM sensor circuit malfunction	Hardware malfunction	P7			blink 18 times
Outdoor ambient sensor open or short circuit	Hardware malfunction	F3		blink 3 times	
Inlet pipe temperature sensor of outdoor condenser is open-circuit/short circuit(commercial air con)	Hardware malfunction	A5			
Outdoor tube sensor open or short circuit	Hardware malfunction	F4		blink 4 times	
outlet pipe temperature sensor of outdoor condenser is open-circuit/short circuit(commercial air con)	Hardware malfunction	A7			
Exhaust sensor open or short circuit	Hardware malfunction	F5		blink 5 times	
Communication failure between indoor unit and outdoor unit	Hardware malfunction	E6	blink 6 times		
Compressor phase current detection circuit malfunction	Hardware malfunction	U1			blink 12 times
Compressor demagnetization protection	It can be displayed through remote controller within 200s and displayed directly after 200s	HE			blink 14 times
PN voltage drop protection		U3			blink 20 times
IPM high temperature protection		P8			blink 19 times
Refrigerant-lacking or blockage protection		F0		blink 10 times	
Capacitor charge malfunction	Hardware malfunction	PU			blink 17 times
Refrigerant system high pressure protection	Hardware malfunction	E1	blink once		
system low-pressure protection (reserved)	Hardware malfunction	E3	blink 3 times		
Compressor over load protection	It can be displayed through remote controller within 200s and displayed directly after 200s	H3			blink 3 times
Fault in matching	Hardware malfunction	LP	blink 19 times		
Loading EEPROM malfunction	Hardware malfunction	EE			blink 15 times
AC current detect circuit malfunction	Hardware malfunction	U5		blink 13 times	
Outdoor DC fan motor malfunction	Hardware malfunction	L3	blink 23 times		

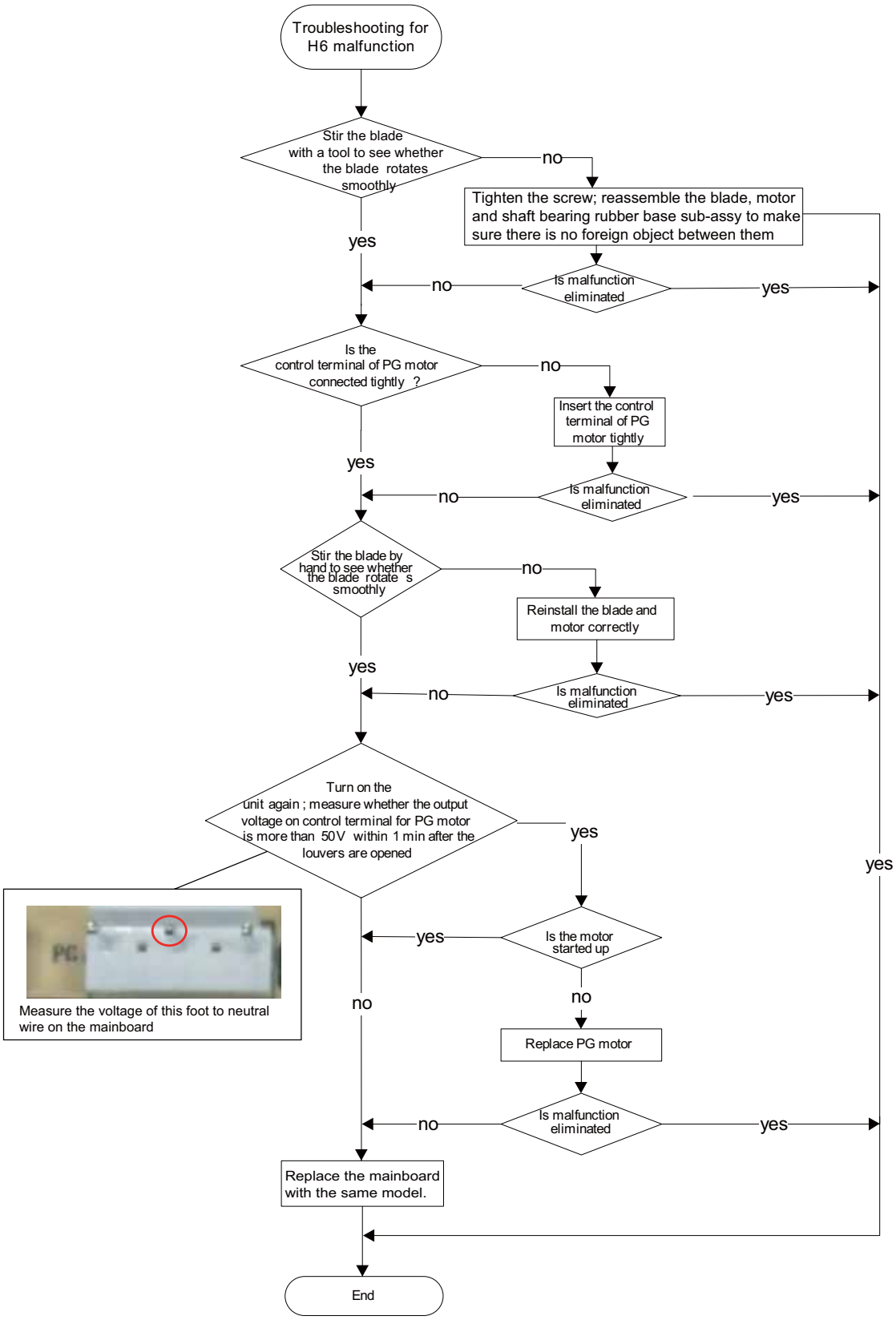
Mode conflict	operation status	E7	blink 7 times		
Recovery refrigerant mode	operation status	Fo	blink once	blink once	
X-fan	operation status			ON for 0.5s and OFF for 10s	
Defrosting or oil return in heating	operation status				OFF for 0.5s and ON for 10s
Startup failure	It can be displayed through remote controller within 200s and displayed directly after 200s	Lc			blink 11 times
Compressor exhaust high temperature protection		E4	blink 4 times		
Anti-high temperature protection		E8	blink 8 times		
AC over-current protection		E5	blink 5 times		
Over compressor phase current protection		P5			blink 15 times
Compressor loss step protection		H7			blink 7 times
Compressor loss of phase protection		Ld			
IPM protection		H5			blink 5 times
Low PN voltage protection		PL			blink 21 times
Over voltage protection for PN		PH		blink 11 times	
PFC protection		HC			blink 6 times
4-way valve reversal abnormal		U7		blink 20 times	

9.2 Procedure of Troubleshooting

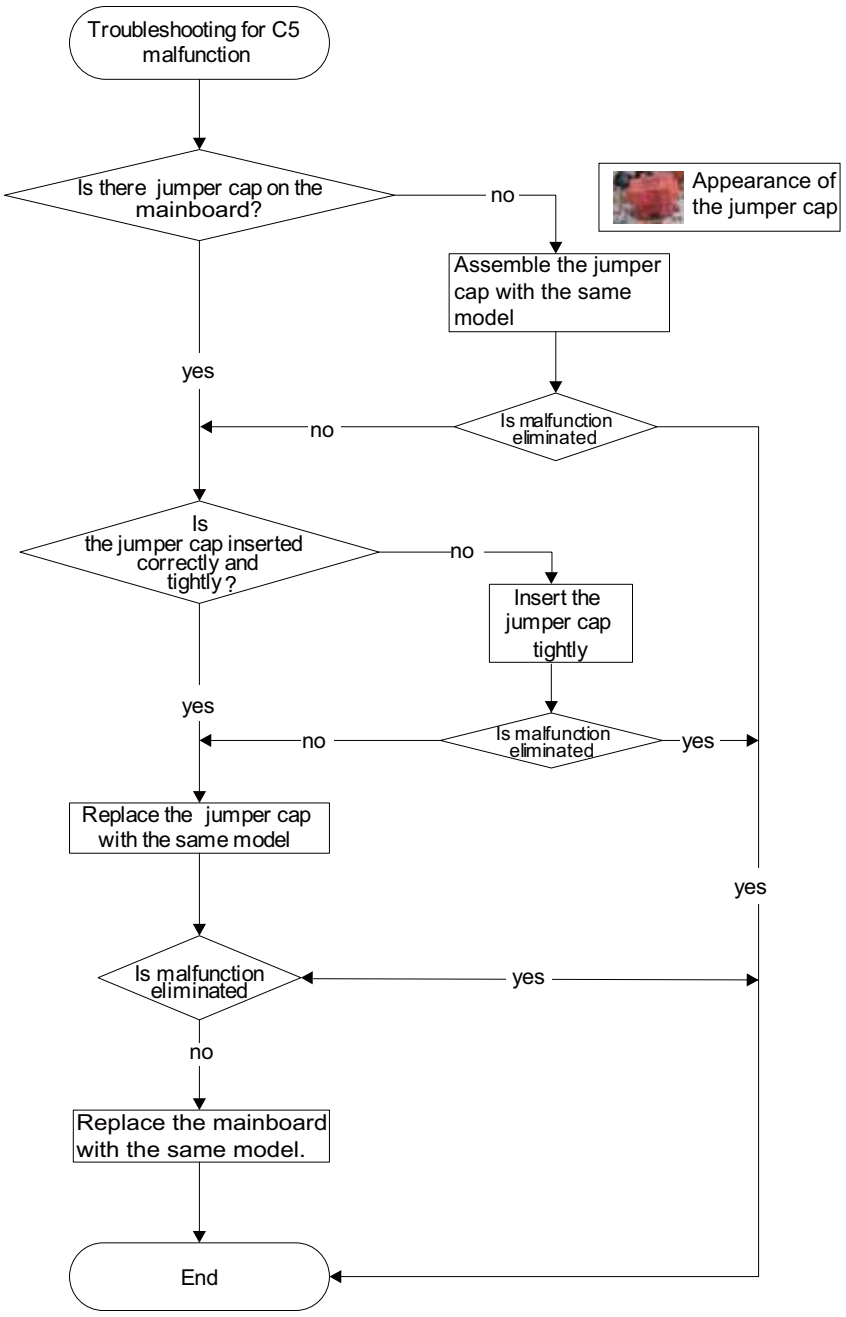
1. Malfunction of Temperature Sensor F1, F2



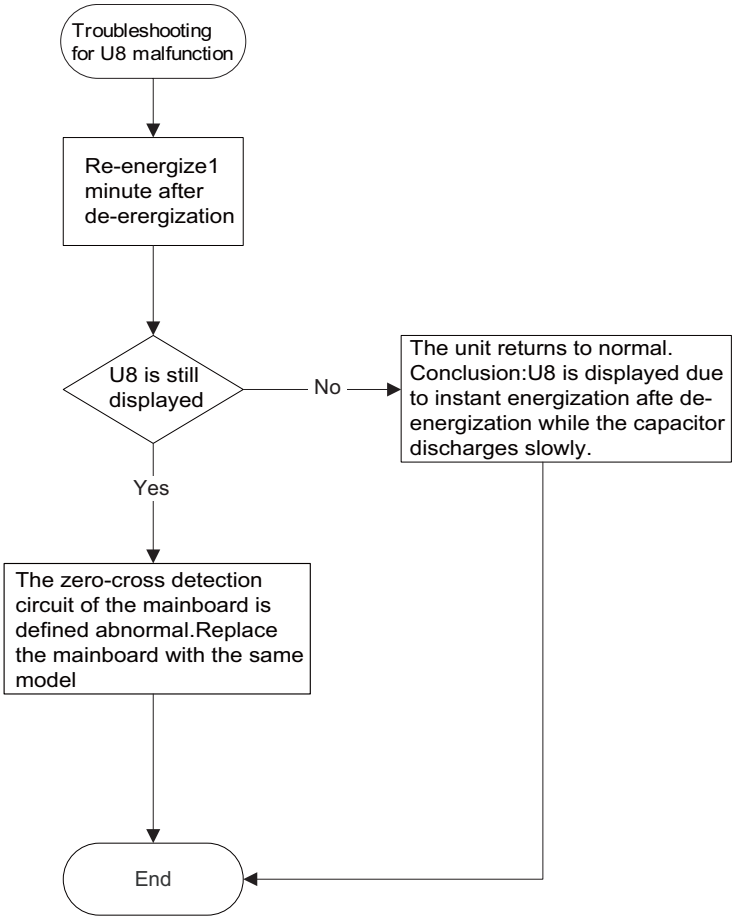
2. Malfunction of Blocked Protection of IDU Fan Motor H6


Troubleshooting for H6 malfunction
Stir the blade with a tool to see whether the blade rotates smoothly
no
Tighten the screw; reassemble the blade, motor and shaft bearing rubber base sub-assy to make sure there is no foreign object between them
yes
Is malfunction eliminated
no
yes
Is the control terminal of PG motor connected tightly ?
no
Insert the control terminal of PG motor tightly
yes
Is malfunction eliminated
no
yes
Stir the blade by hand to see whether the blade rotate s smoothly
no
Reinstall the blade and motor correctly
yes
Is malfunction eliminated
no
yes
Turn on the unit again ; measure whether the output voltage on control terminal for PG motor is more than 50V within 1 min after the louvers are opened
yes
yes
PG
Measure the voltage of this foot to neutral wire on the mainboard
Is the motor started up
yes
no
no
Replace PG motor
Is malfunction eliminated
no
yes
Replace the mainboard with the same model.
End

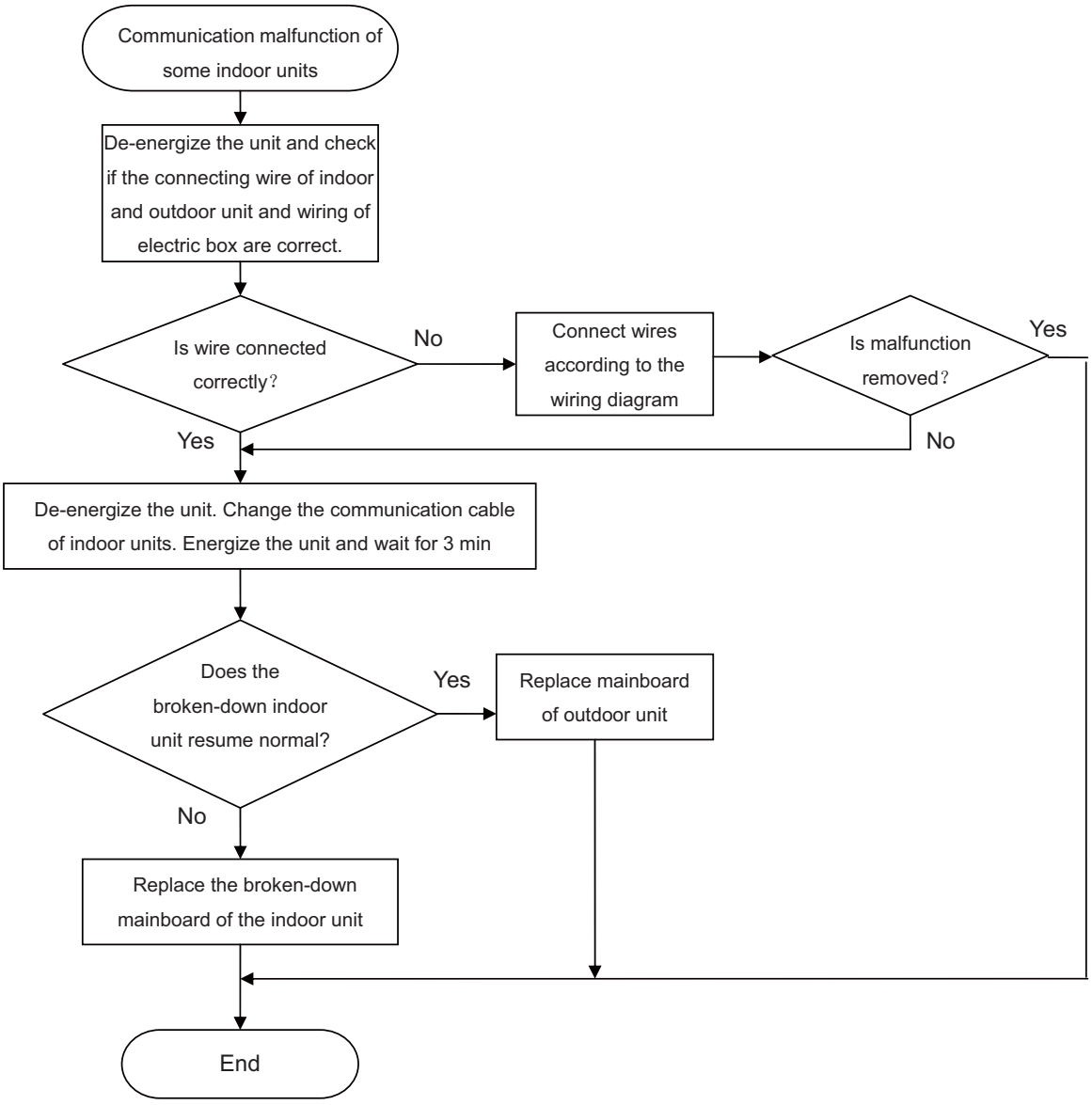
3. Malfunction of Protection of Jumper Cap C5

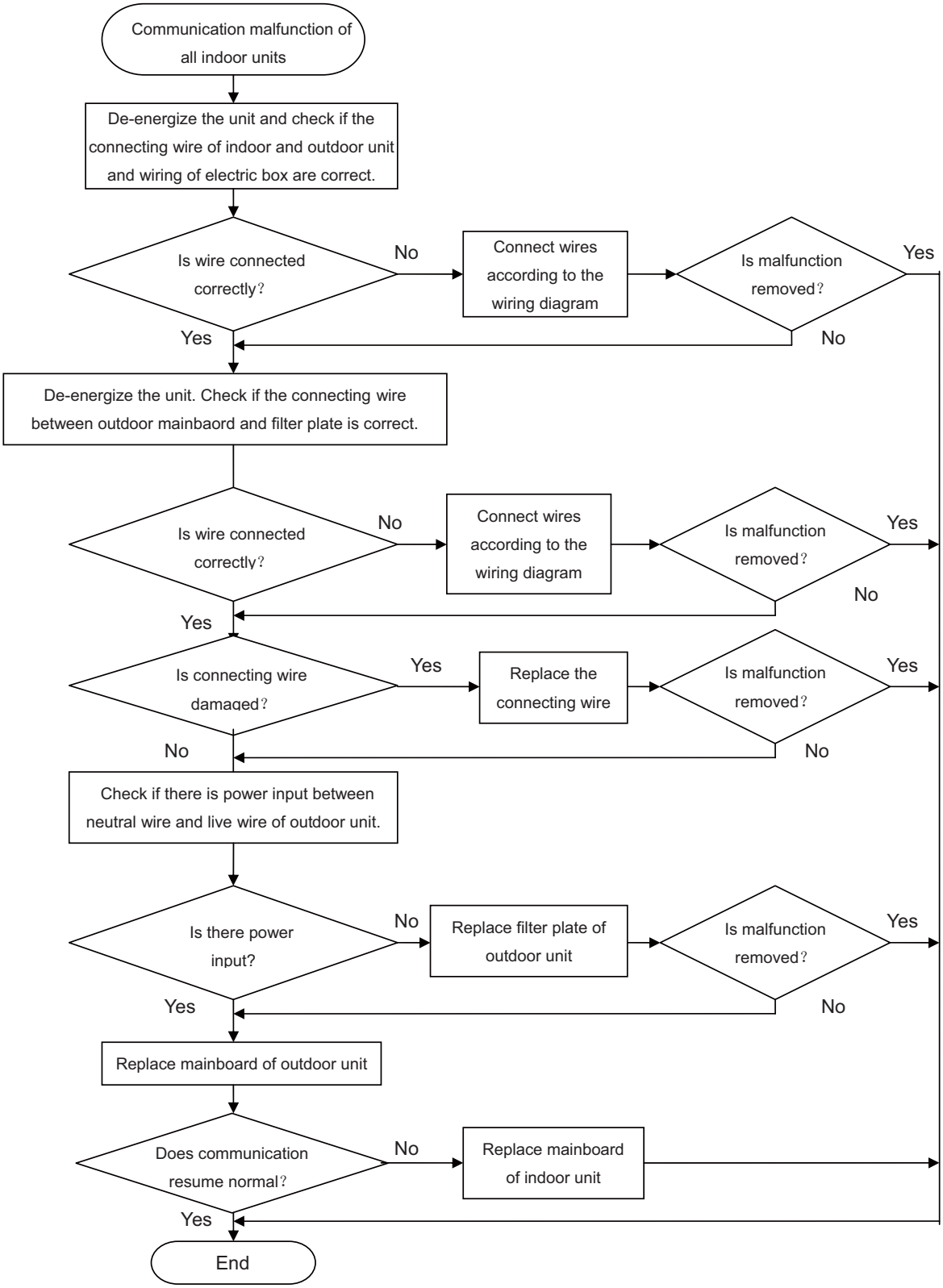


4. Malfunction of Zero-crossing Inspection Circuit Malfunction of the IDU Fan Motor U8


Troubleshooting for U8 malfunction
Re-energize1 minute after de-erergization
U8 is still displayed
No
The unit returns to normal. Conclusion:U8 is displayed due to instant energization afte de-energization while the capacitor discharges slowly.
Yes
The zero-cross detection circuit of the mainboard is defined abnormal.Replace the mainboard with the same model
End

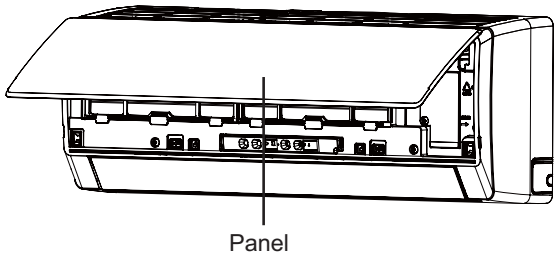
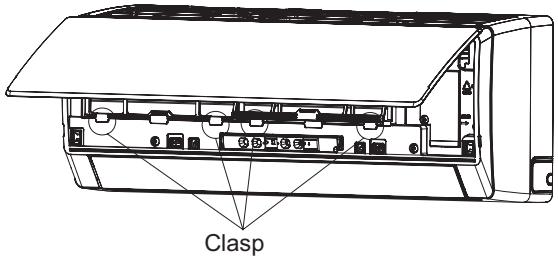
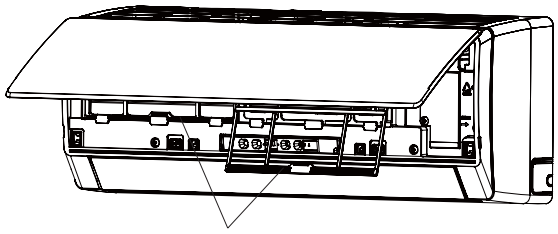
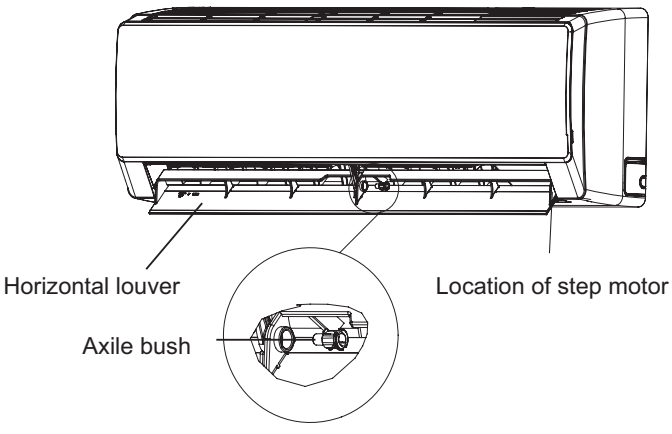
5. E6 Malfunction

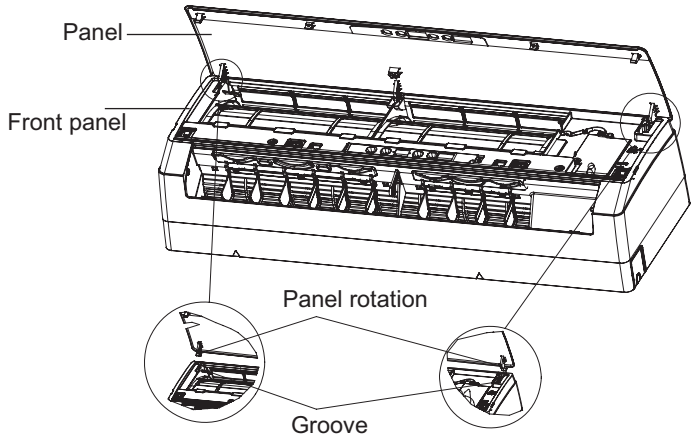
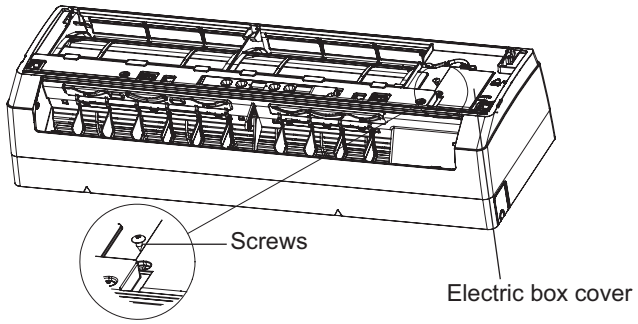
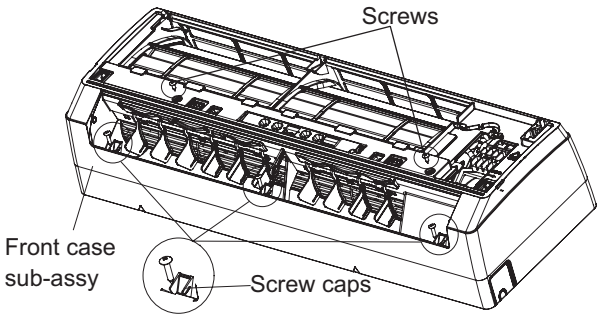
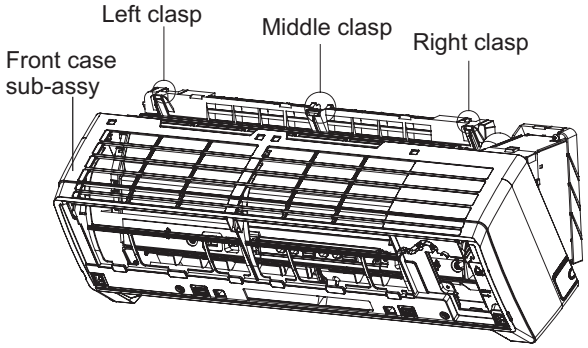

Communication malfunction of some indoor units
De-energize the unit and check if the connecting wire of indoor and outdoor unit and wiring of electric box are correct.
Is wire connected correctly?
No
Connect wires according to the wiring diagram
Is malfunction removed?
Yes
No
Yes
De-energize the unit. Change the communication cable of indoor units. Energize the unit and wait for 3 min
Does the broken-down indoor unit resume normal?
Yes
Replace mainboard of outdoor unit
No
Replace the broken-down mainboard of the indoor unit
End


Communication malfunction of all indoor units
De-energize the unit and check if the connecting wire of indoor and outdoor unit and wiring of electric box are correct.
Is wire connected correctly?
No
Connect wires according to the wiring diagram
Is malfunction removed?
Yes
No
Yes
De-energize the unit. Check if the connecting wire between outdoor mainbaord and filter plate is correct.
Is wire connected correctly?
No
Connect wires according to the wiring diagram
Is malfunction removed?
Yes
No
Yes
Is connecting wire damaged?
Yes
Replace the connecting wire
Is malfunction removed?
Yes
No
No
Check if there is power input between neutral wire and live wire of outdoor unit.
Is there power input?
No
Replace filter plate of outdoor unit
Is malfunction removed?
Yes
Yes
No
Replace mainboard of outdoor unit
Does communication resume normal?
No
Replace mainboard of indoor unit
Yes
End

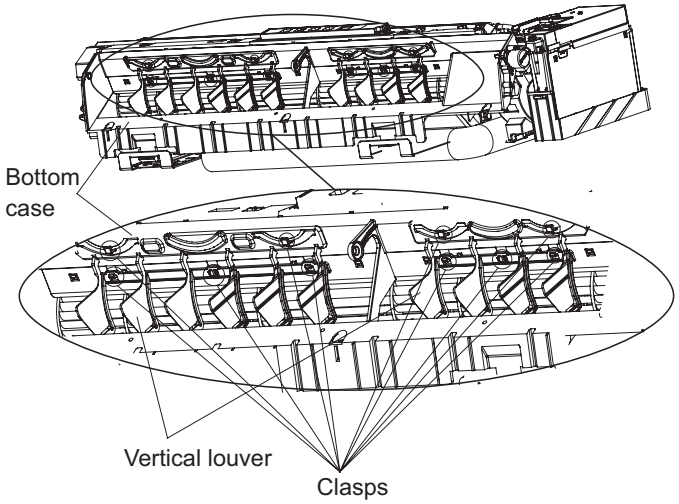
10. Removal Procedure

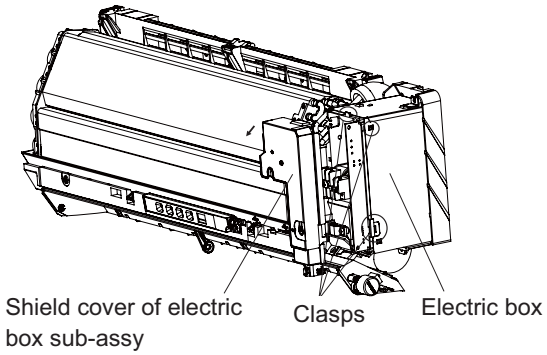
⚠ Caution: discharge the refrigerant completely before removal.

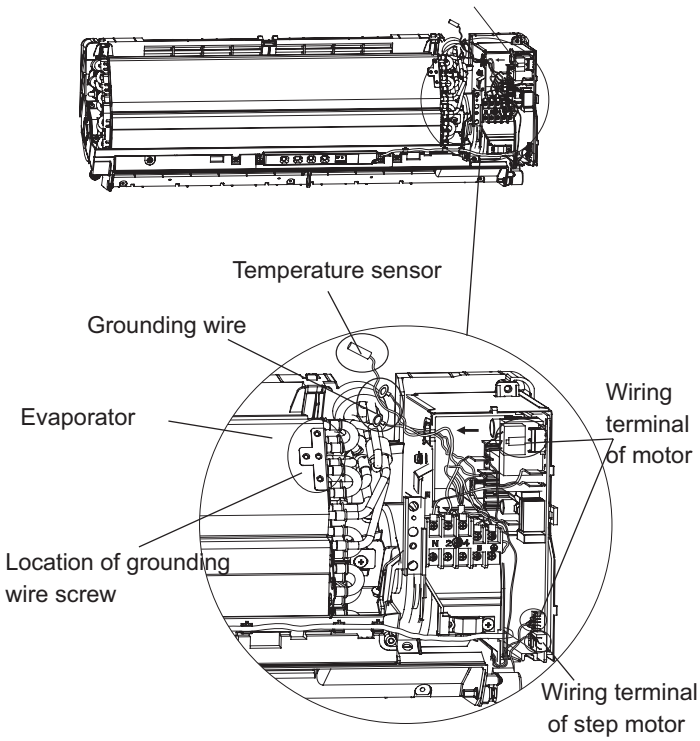
Step	Procedure	
1. Remove filter		 Panel
a	Open the panel.	
b	Loosen the clasp shown in the fig and then pull the left filter and right filer outwards to remove them.	 Clasp  left filter and right filer
2. Remove horizontal louver		 Horizontal louver Location of step motor Axile bush
	Push out the axile bush on horizontal louver. Bend the horizontal louver with hand and then separate the horizontal louver from the crankshaft of step motor to remove it.	

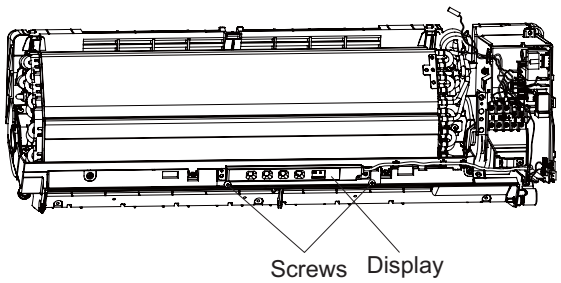
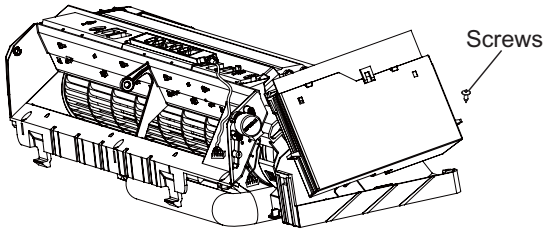
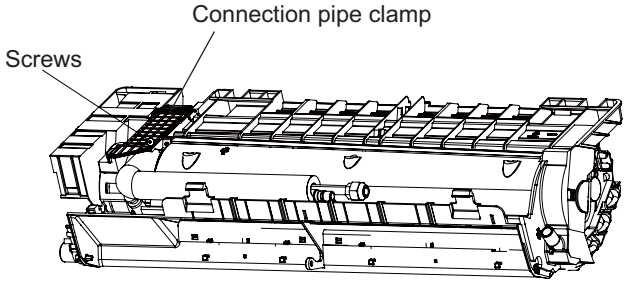
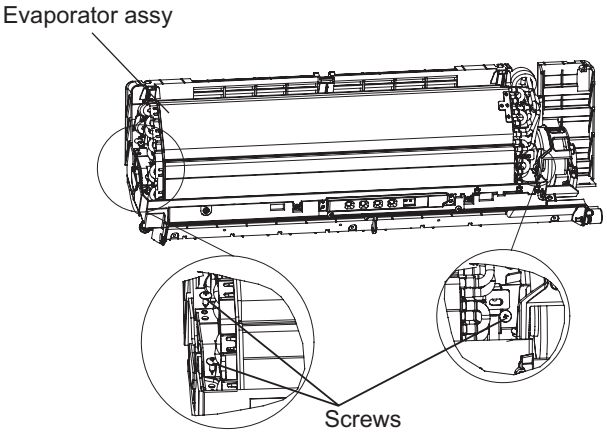
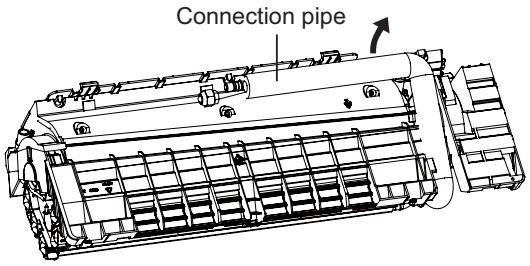
Step	Procedure	
3. Remove panel		
	Open the front panel; separate the panel rotation shaft from the groove fixing the front panel and then removes the front panel. Note: The display of some models is fixed on the panel; unscrew the screws fixing the display on the panel before removing the panel.	
4. Remove electric box cover		
	Remove the screws on the electric box cover to remove the electric box cover.	
5. Remove front case sub-assy		
a	Remove the screws fixing front case. Note: 1.Open the screw caps before removing the screws around the air outlet. 2.The quantity of screws fixing the front case sub-assy is different for different models.	
b	Loosen the clasps at left, middle and right sides of front case. Life the front case sub-assy upwards to remove it.	

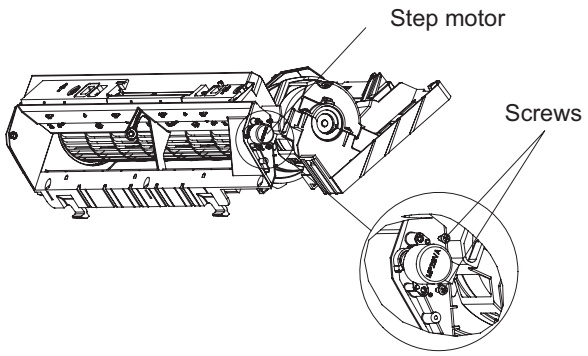
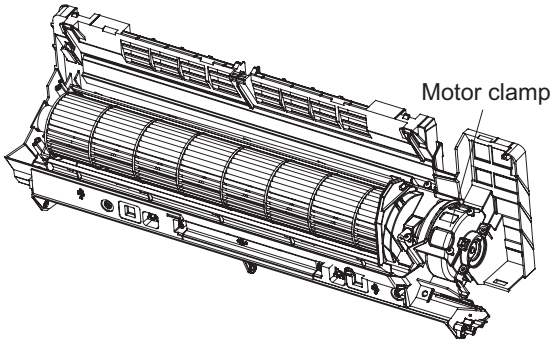
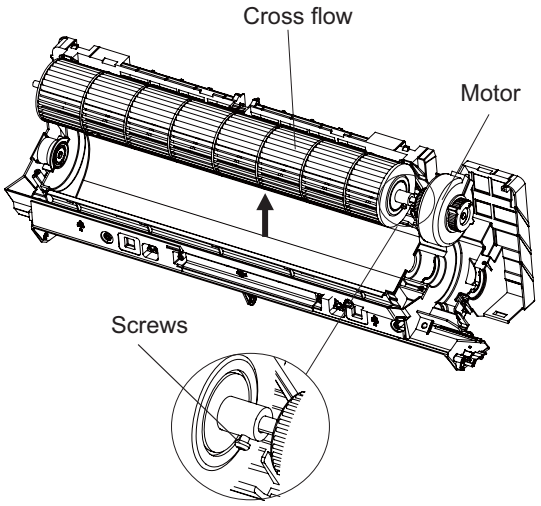
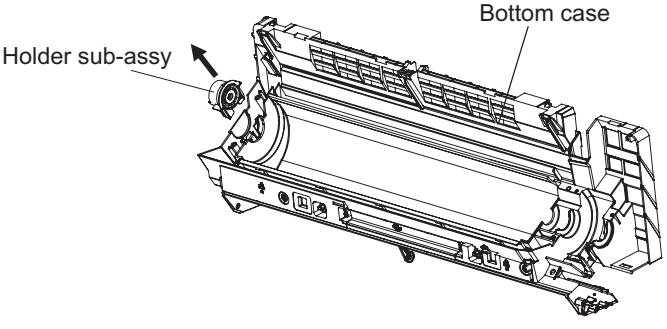
Step	Procedure
6. Remove vertical louver	
	Loosen the connection clasps between vertical louver and bottom case to remove vertical louver.
7. Remove electric box assy	
a	Loosen the connection clasps between shield cover of electric box sub-assy and electric box, and then remove the shield cover of electric box sub-assy.
b	Cut off the tieline which binding the temperature sensor and grounding wire on the evaporator, and then pull out the indoor tube temperature sensor from the evaporator. Remove the screws at the connection place between grounding wire and evaporator. Pull out the wiring terminal of motor and wiring terminal of step motor from the mainboard. Note: 1.Location of tube temperature sensor and tieline on the evaporator is different for different models. 2.When pulling out the wiring terminal, pay attention to loose the clasp and don't pull it so hard.







Step	Procedure	
c	Remove two screws fixing display. Note: The display of some models is fixed on the panel; unscrew the screws fixing the display on the panel before removing the panel.	
d	Remove the screw fixing electric box assy and then remove the electric box assy.	
8. Remove evaporator assy		
a	At the back of the unit, remove the screw fixing connection pipe clamp and then remove the connection pipe clamp.	
b	Remove 3 screws fixing evaporator assy.	
c	Adjust the position of connection pipe on evaporator slightly and then lift the evaporator upwards to remove it.	

Step	Procedure
9. Remove stepping motor	
Remove the screw fixing step motor and then remove the step motor.	
10. Remove motor and cross flow blade	
a Remove the screws fixing motor clamp and then remove the motor clamp.	
b Remove the screws at the connection place of cross flow blade and motor; lift the motor and cross flow blade upwards to remove them.	
c Remove the bearing holder sub-assy.	

Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: Tf=Tcx1.8+32

Set temperature

Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)
61	60.8	16		69/70	69.8	21		78/79	78.8	26
62/63	62.6	17		71/72	71.6	22		80/81	80.6	27
64/65	64.4	18		73/74	73.4	23		82/83	82.4	28
66/67	66.2	19		75/76	75.2	24		84/85	84.2	29
68	68	20		77	77	25		86	86	30

Ambient temperature

Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)		Fahrenheit display temperature (℉)	Fahrenheit (℉)	Celsius (℃)
32/33	32	0		55/56	55.4	13		79/80	78.8	26
34/35	33.8	1		57/58	57.2	14		81	80.6	27
36	35.6	2		59/60	59	15		82/83	82.4	28
37/38	37.4	3		61/62	60.8	16		84/85	84.2	29
39/40	39.2	4		63	62.6	17		86/87	86	30
41/42	41	5		64/65	64.4	18		88/89	87.8	31
43/44	42.8	6		66/67	66.2	19		90	89.6	32
45	44.6	7		68/69	68	20		91/92	91.4	33
46/47	46.4	8		70/71	69.8	21		93/94	93.2	34
48/49	48.2	9		72	71.6	22		95/96	95	35
50/51	50	10		73/74	73.4	23		97/98	96.8	36
52/53	51.8	11		75/76	75.2	24		99	98.6	37
54	53.6	12		77/78	77	25				

Appendix 2: Configuration of Connection Pipe

1.Standard length of connection pipe

● 5m, 7.5m, 8m.

2.Min. length of connection pipe is 3m.

3.Max. length of connection pipe and max. high difference.

4.The additional refrigerant oil and refrigerant charging required after prolonging connection pipe

● After the length of connection pipe is prolonged for 10m at the basis of standard length, you should add 5ml of refrigerant oil for each additional 5m of connection pipe.

● The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):

Cooling capacity	Max length of connection pipe	Max height difference
5000 Btu/h(1465 W)	15 m	5 m
7000 Btu/h(2051 W)	15 m	5 m
9000 Btu/h(2637 W)	15 m	10 m
12000 Btu/h(3516 W)	20 m	10 m
18000 Btu/h(5274 W)	25 m	10 m
24000 Btu/h(7032 W)	25 m	10 m
28000 Btu/h(8204 W)	30 m	10 m
36000 Btu/h(10548 W)	30 m	20 m
42000 Btu/h(12306 W)	30 m	20 m
48000 Btu/h(14064 W)	30 m	20 m

● When the length of connection pipe is above 5m, add refrigerant according to the prolonged length of liquid pipe. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.

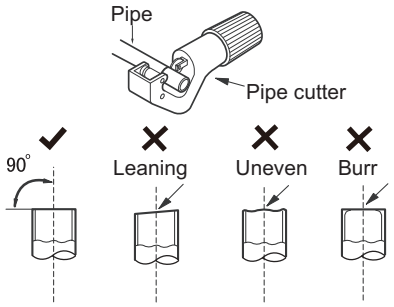
● Additional refrigerant charging amount = prolonged length of liquid pipe X additional refrigerant charging amount per meter

Additional refrigerant charging amount for R22, R407C, R410A and R134a			
Diameter of connection pipe		Outdoor unit throttle	
Liquid pipe(mm)	Gas pipe(mm)	Cooling only(g/m)	Cooling and heating(g/m)
Φ6	Φ9.5 or Φ12	15	20
Φ6 or Φ9.5	Φ16 or Φ19	15	20
Φ12	Φ19 or Φ22.2	30	120
Φ16	Φ25.4 or Φ31.8	60	120
Φ19	/	250	250
Φ22.2	/	350	350

Appendix 3: Pipe Expanding Method

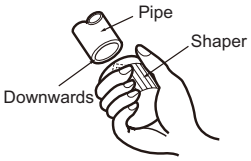
⚠ **Note:**

Improper pipe expanding is the main cause of refrigerant leakage.Please expand the pipe according to the following steps:



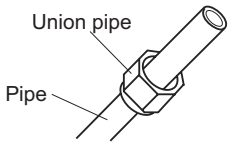
A:Cut the pip
- Confirm the pipe length according to the distance of indoor unit and outdoor unit.
- Cut the required pipe with pipe cutter.

B:Remove the burrs
- Remove the burrs with shaper and prevent the burrs from getting into the pipe.



C:Put on suitable insulating pipe

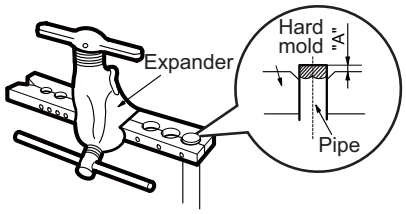
D:Put on the union nut
- Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



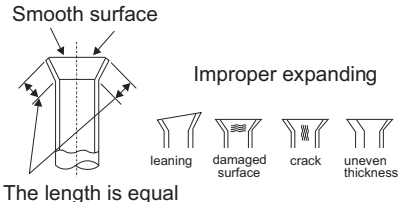
E:Expand the port
- Expand the port with expander.

⚠ **Note:**
- "A" is different according to the diameter, please refer to the sheet below:

Outer diameter(mm)	A(mm)	
	Max	Min
Φ6 - 6.35 (1/4")	1.3	0.7
Φ9.52 (3/8")	1.6	1.0
Φ12 - 12.70 (1/2")	1.8	1.0
Φ16 - 15.88 (5/8")	2.4	2.2



F:Inspection
- Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.



Appendix 4: List of Resistance for Ambient Temperature Sensor

Appendix 1: Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(15K)

Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)
-19	138.1		20	18.75		59	3.848		98	1.071
-18	128.6		21	17.93		60	3.711		99	1.039
-17	121.6		22	17.14		61	3.579		100	1.009
-16	115		23	16.39		62	3.454		101	0.98
-15	108.7		24	15.68		63	3.333		102	0.952
-14	102.9		25	15		64	3.217		103	0.925
-13	97.4		26	14.36		65	3.105		104	0.898
-12	92.22		27	13.74		66	2.998		105	0.873
-11	87.35		28	13.16		67	2.896		106	0.848
-10	82.75		29	12.6		68	2.797		107	0.825
-9	78.43		30	12.07		69	2.702		108	0.802
-8	74.35		31	11.57		70	2.611		109	0.779
-7	70.5		32	11.09		71	2.523		110	0.758
-6	66.88		33	10.63		72	2.439		111	0.737
-5	63.46		34	10.2		73	2.358		112	0.717
-4	60.23		35	9.779		74	2.28		113	0.697
-3	57.18		36	9.382		75	2.206		114	0.678
-2	54.31		37	9.003		76	2.133		115	0.66
-1	51.59		38	8.642		77	2.064		116	0.642
0	49.02		39	8.297		78	1.997		117	0.625
1	46.6		40	7.967		79	1.933		118	0.608
2	44.31		41	7.653		80	1.871		119	0.592
3	42.14		42	7.352		81	1.811		120	0.577
4	40.09		43	7.065		82	1.754		121	0.561
5	38.15		44	6.791		83	1.699		122	0.547
6	36.32		45	6.529		84	1.645		123	0.532
7	34.58		46	6.278		85	1.594		124	0.519
8	32.94		47	6.038		86	1.544		125	0.505
9	31.38		48	5.809		87	1.497		126	0.492
10	29.9		49	5.589		88	1.451		127	0.48
11	28.51		50	5.379		89	1.408		128	0.467
12	27.18		51	5.197		90	1.363		129	0.456
13	25.92		52	4.986		91	1.322		130	0.444
14	24.73		53	4.802		92	1.282		131	0.433
15	23.6		54	4.625		93	1.244		132	0.422
16	22.53		55	4.456		94	1.207		133	0.412
17	21.51		56	4.294		95	1.171		134	0.401
18	20.54		57	4.139		96	1.136		135	0.391
19	19.63		58	3.99		97	1.103		136	0.382

Appendix 1: Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(20K)

Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)
-19	181.4		20	25.01		59	5.13		98	1.427
-18	171.4		21	23.9		60	4.948		99	1.386
-17	162.1		22	22.85		61	4.773		100	1.346
-16	153.3		23	21.85		62	4.605		101	1.307
-15	145		24	20.9		63	4.443		102	1.269
-14	137.2		25	20		64	4.289		103	1.233
-13	129.9		26	19.14		65	4.14		104	1.198
-12	123		27	18.13		66	3.998		105	1.164
-11	116.5		28	17.55		67	3.861		106	1.131
-10	110.3		29	16.8		68	3.729		107	1.099
-9	104.6		30	16.1		69	3.603		108	1.069
-8	99.13		31	15.43		70	3.481		109	1.039
-7	94		32	14.79		71	3.364		110	1.01
-6	89.17		33	14.18		72	3.252		111	0.983
-5	84.61		34	13.59		73	3.144		112	0.956
-4	80.31		35	13.04		74	3.04		113	0.93
-3	76.24		36	12.51		75	2.94		114	0.904
-2	72.41		37	12		76	2.844		115	0.88
-1	68.79		38	11.52		77	2.752		116	0.856
0	65.37		39	11.06		78	2.663		117	0.833
1	62.13		40	10.62		79	2.577		118	0.811
2	59.08		41	10.2		80	2.495		119	0.77
3	56.19		42	9.803		81	2.415		120	0.769
4	53.46		43	9.42		82	2.339		121	0.746
5	50.87		44	9.054		83	2.265		122	0.729
6	48.42		45	8.705		84	2.194		123	0.71
7	46.11		46	8.37		85	2.125		124	0.692
8	43.92		47	8.051		86	2.059		125	0.674
9	41.84		48	7.745		87	1.996		126	0.658
10	39.87		49	7.453		88	1.934		127	0.64
11	38.01		50	7.173		89	1.875		128	0.623
12	36.24		51	6.905		90	1.818		129	0.607
13	34.57		52	6.648		91	1.736		130	0.592
14	32.98		53	6.403		92	1.71		131	0.577
15	31.47		54	6.167		93	1.658		132	0.563
16	30.04		55	5.942		94	1.609		133	0.549
17	28.68		56	5.726		95	1.561		134	0.535
18	27.39		57	5.519		96	1.515		135	0.521
19	26.17		58	5.32		97	1.47		136	0.509

Appendix 1: Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor Units(50K)

Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)
-29	853.5		10	98		49	18.34		88	4.75
-28	799.8		11	93.42		50	17.65		89	4.61
-27	750		12	89.07		51	16.99		90	4.47
-26	703.8		13	84.95		52	16.36		91	4.33
-25	660.8		14	81.05		53	15.75		92	4.20
-24	620.8		15	77.35		54	15.17		93	4.08
-23	580.6		16	73.83		55	14.62		94	3.96
-22	548.9		17	70.5		56	14.09		95	3.84
-21	516.6		18	67.34		57	13.58		96	3.73
-20	486.5		19	64.33		58	13.09		97	3.62
-19	458.3		20	61.48		59	12.62		98	3.51
-18	432		21	58.77		60	12.17		99	3.41
-17	407.4		22	56.19		61	11.74		100	3.32
-16	384.5		23	53.74		62	11.32		101	3.22
-15	362.9		24	51.41		63	10.93		102	3.13
-14	342.8		25	49.19		64	10.54		103	3.04
-13	323.9		26	47.08		65	10.18		104	2.96
-12	306.2		27	45.07		66	9.83		105	2.87
-11	289.6		28	43.16		67	9.49		106	2.79
-10	274		29	41.34		68	9.17		107	2.72
-9	259.3		30	39.61		69	8.85		108	2.64
-8	245.6		31	37.96		70	8.56		109	2.57
-7	232.6		32	36.38		71	8.27		110	2.50
-6	220.5		33	34.88		72	7.99		111	2.43
-5	209		34	33.45		73	7.73		112	2.37
-4	198.3		35	32.09		74	7.47		113	2.30
-3	199.1		36	30.79		75	7.22		114	2.24
-2	178.5		37	29.54		76	7.00		115	2.18
-1	169.5		38	28.36		77	6.76		116	2.12
0	161		39	27.23		78	6.54		117	2.07
1	153		40	26.15		79	6.33		118	2.02
2	145.4		41	25.11		80	6.13		119	1.96
3	138.3		42	24.13		81	5.93		120	1.91
4	131.5		43	23.19		82	5.75		121	1.86
5	125.1		44	22.29		83	5.57		122	1.82
6	119.1		45	21.43		84	5.39		123	1.77
7	113.4		46	20.6		85	5.22		124	1.73
8	108		47	19.81		86	5.06		125	1.68
9	102.8		48	19.06		87	4.90		126	1.64

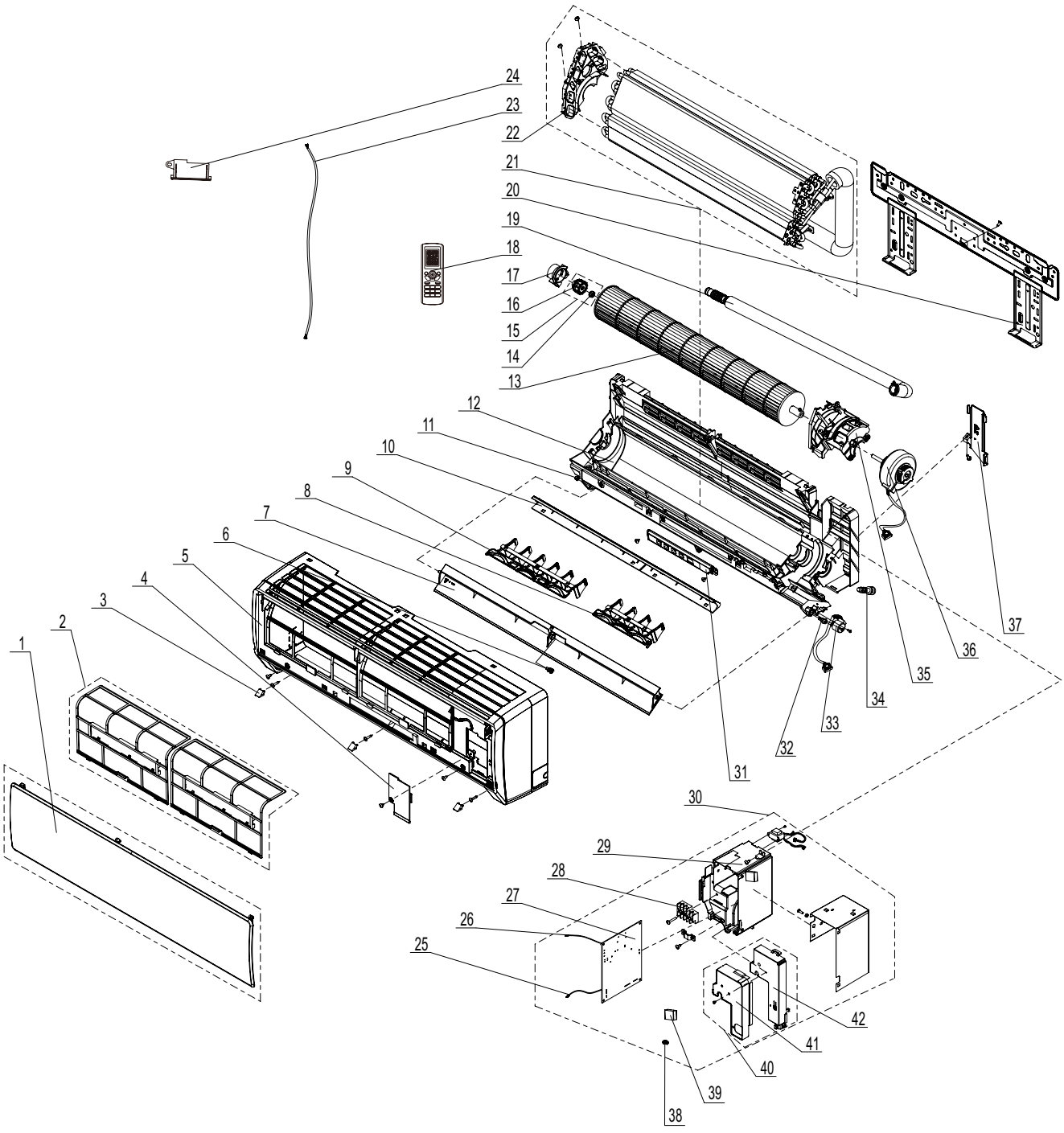
PARTS GUIDE

MULTI SYSTEM SERIE

MS-H07AIM PT, MS-H09AIM PT
MS-H12AIM PT, MS-H18AIM PT

sinclair
AIR CONDITIONING

MS-H07AIC PT, MS-H09AIC PT



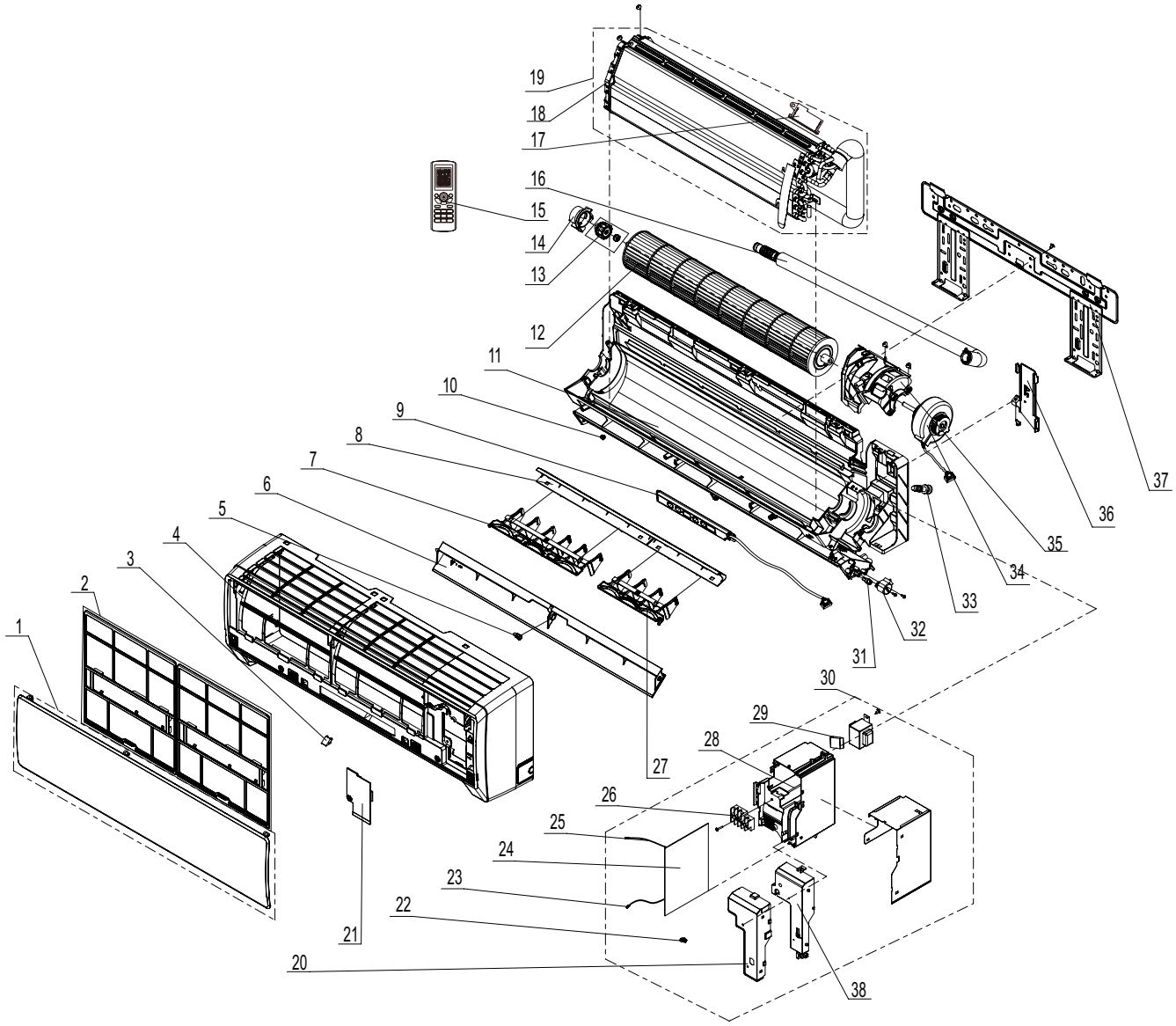
No	Description	Part Code	Note	Qty	Price Code
MODEL: MS-H07AIC PT					
1	Receiver Window	none		0	
2	Front Panel Assy	2001217601		1	
3	Filter Sub-Assy	11122081		2	
4	Screw Cover	24252016		3	
5	Front Case	20012120C		1	
6	Swing Louver	10512114		1	
7	Air Louver 1	10512113		1	
8	Helicoid tongue	26112162		1	
9	Axile Bush	10542704		1	
10	Rear Case assy	2220210111		1	
11	Water Tray Glue Plug	76712012		1	
12	Ring of Bearing	26152022		1	
13	O-Gasket sub-assy of Bearing	none		1	
14	Cross Flow Fan	10352043		1	
15	Remote Controller YT1F(XFAN)	305100492		1	
16	Ambient Temperature Sensor 15KS-XH-2P-K3-300mm	390000453		1	
17	Temperature Sensor 20KT-EH-2P-K3-410mm	390000599		1	
18	Connecting Cable (4G0.75)	4002052317		0	
19	Evaporator Support	24212090		1	
20	Evaporator Assy	0100274301		1	
21	Wall-Mounting Frame	01252015		1	
22	Motor Press Plate	26112160		1	
23	Fan Motor FN10A-PG	15012115		1	
24	Pipe Clamp	26112164		1	
25	Drainage hose	0523001406		1	
26	Step Motor MP24AA	1521212901		1	
27	Crank	10582070		1	
28	Receiver Board D5183B	30565012		1	
29	Guide Louver1	10512111		1	
30	Axile Bush	10542036		1	
31	Electric Box	2011216701		1	
32	Terminal Board	42011233		1	
33	Capacitor CBB61 1uF/500VAC	33010002		1	
34	Electric Box Cover2	20122075		1	
35	Jumping Connector	4202300101		1	
36	Main Board M836F2SBJ	30148874		1	
37	Shield cover of Electric Box sub-assy	0159207301		1	
38	Electric Box Cover1	22242135		1	
39	Electric Box Assy	20402551		1	
40	Cold Plasma Generator	1114001602		1	

The data are subject to change without notice.

No	Description	Part Code	Note	Qty	Price Code
MODEL: MS-H09AIC PT					
1	Receiver Window	none		0	
2	Front Panel Assy	2001217601		1	
3	Filter Sub-Assy	11122081		2	
4	Screw Cover	24252016		3	
5	Front Case	20012120C		1	
6	Swing Louver	10512114		1	
7	Air Louver 1	10512113		1	
8	Helicoid tongue	26112162		1	
9	Axile Bush	10542704		1	
10	Rear Case assy	2220210111		1	
11	Water Tray Glue Plug	76712012		1	
12	Ring of Bearing	26152022		1	
13	O-Gasket sub-assy of Bearing	7651205102		1	
14	Cross Flow Fan	10352043		1	
15	Remote Controller YT1F(XFAN)	305100492		1	
16	Ambient Temperature Sensor 15KS-XH-2P-K3-300mm	390000453		1	
17	Temperature Sensor 20KT-EH-2P-K3-410mm	390000599		1	
18	Connecting Cable (4G0.75)	4002052317		0	
19	Evaporator Support	24212090		1	
20	Evaporator Assy	0100274301		1	
21	Wall-Mounting Frame	01252015		1	
22	Motor Press Plate	26112160		1	
23	Fan Motor FN10A-PG	15012115		1	
24	Pipe Clamp	26112164		1	
25	Drainage hose	0523001406		1	
26	Step Motor MP24AA	1521212901		1	
27	Crank	10582070		1	
28	Receiver Board D5183B	30565012		1	
29	Guide Louver1	10512111		1	
30	Axile Bush	10542036		1	
31	Electric Box	2011216701		1	
32	Terminal Board	42011233		1	
33	Capacitor CBB61 1uF/500VAC	33010002		1	
34	Electric Box Cover2	20122075		1	
35	Jumping Connector	4202300101		1	
36	Main Board M836F2SBJ	30148874		1	
37	Shield cover of Electric Box sub-assy	0159207301		1	
38	Electric Box Cover1	22242135		1	
39	Electric Box Assy	20402551		1	
40	Cold Plasma Generator	1114001602		1	

The data are subject to change without notice.

MS-H12AIC PT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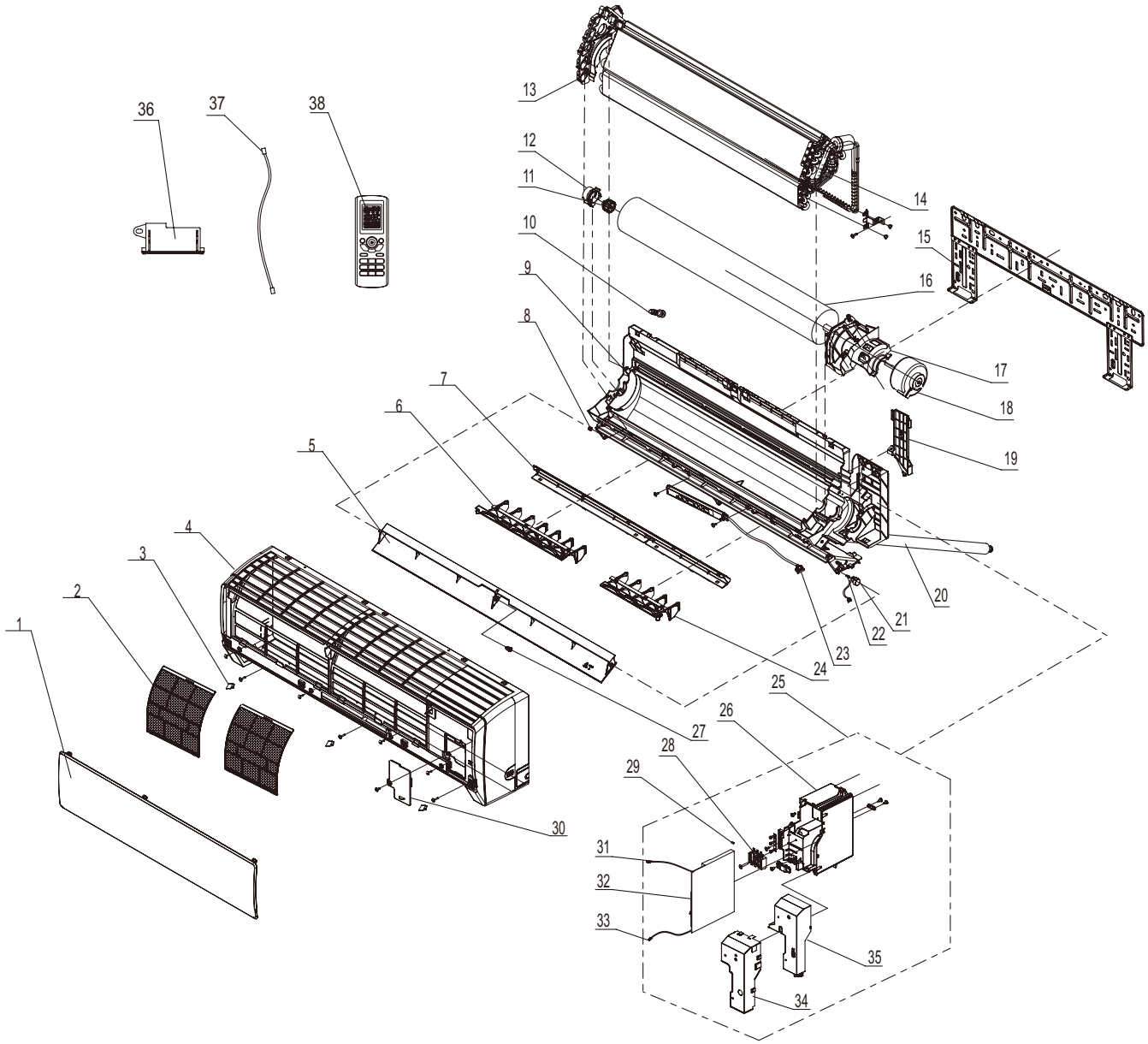
No	Description	Part Code	Note	Qty	Price Code
MODEL: MS-H12AIC PT					
1	Decorative Board	2019223604		1	
2	Front Panel Sub-Assy	20012557		1	
3	Filter Sub-Assy	1112220403		2	
4	Screw Cover	24252016		1	
5	Front Case Sub-Assy	2001213908		1	
6	Air Louver 2	10512155		1	
7	Air Louver 1	10512156		1	
8	Helicoid Tongue	26112163		1	
9	Left Axile Bush	10512037		1	
10	Rear Case assy	2220210301		1	
11	Water Tray Glue Plug	76712012		1	
12	Ring of Bearing	26152022		1	
13	O-Gasket sub-assy of Bearing	7651205102		1	
14	Cross Flow Fan	10352017		1	
15	Remote Controller YT1F(XFAN)	305100492		1	
16	Temperature Sensor 20KT-EH-2P-K3-410mm	390000599		1	
17	Ambient Temperature Sensor 15KS-XH-2P-300mm	390000453		1	
18	Connecting Cable (4G0.75)	4002052317		0	
19	Evaporator Support	24212091		1	
20	Evaporator Assy	0100274401		1	
21	Wall Mounting Frame	01252021		1	
22	Motor Press Plate	26112161		1	
23	Motor FN20J-PG	150120874		1	
24	Pipe Clamp	26112164		1	
25	Drainage Pipe	0523001401		1	
26	Step Motor MP24AA	1521212901		1	
27	Crank	10582070		1	
28	Receiver Board D5183B	30565012		1	
29	Guide Louver	10512157		1	
30	Axile Bush	10542036		1	
31	Electric Box	2011216701		1	
32	Terminal Board	42011233		1	
33	Capacitor CBB61 1uF/500VAC	33010002		1	
34	Electric Box Cover2	20122075		1	
35	Jumper Cap	4202300104		1	
36	Main Board M836F2SBJ	30148874		1	
37	Shield cover of Electric Box sub-assy	0159207301		1	
38	Electric Box Cover1	22242135		1	
39	Electric Box Assy	20402556		1	

The data are subject to change without notice.

MS-H18AIC PT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No	Description	Part Code	Note	Qty	Price Code
MODEL: MS-H18AIC PT					
1	Decorative Board	none		1	
2	Front Panel Assy	20012280		1	
3	Filter Sub-Assy	1112208901		2	
4	Screw Cover	24252016		3	
5	Baffle Plate	26112228		1	
6	Front Case Sub-assy	20022172		1	
7	Air Louver 2	10512117		1	
8	Air Louver 1	10512116		1	
9	Helicoid Tongue	26112238		1	
10	Left Axile Bush	10512037		1	
11	Rear Case assy	12312214		1	
12	Water Tray Glue Plug	76712012		1	
13	Ring of Bearing	26152022		1	
14	O-Gasket sub-assy of Bearing	7651205102		1	
15	Cross Flow Fan	10352019		1	
16	Remote Controller YT1F(XFAN)	305100492		1	
17	Temperature Sensor 20KT-EH-2P-K3-410mm	390000599		1	
18	Ambient Temperature Sensor 15KS-XH-2P-K3-300mm	390000453		1	
19	Connecting Cable (4G0.75)	4002052317		0	
20	Evaporator Support	24212133		1	
21	Evaporator Assy	01002774		1	
22	Wall Mounting Frame	01252218		1	
23	Motor Press Plate	26112494		1	
24	Fan Motor FN20V-PG	15012146		1	
25	Pipe Clamp	26112164		1	
26	Drain Pipe	05230014		1	
27	Step Motor MP28VB	15012086		1	
28	Crank	10582070		1	
29	Display Board D5183Q	30565039		1	
30	Guide Louver	10512115		1	
31	Axile Bush	10542036		1	
32	Electric Box	2011210801		1	
33	Terminal Board	42011233		1	
34	Capacitor CBB611A 1.5uF/500VAC	33010043		1	
35	Electric Box Cover2	20112081		1	
36	Jumper Cap	4202300108		1	
37	Main Board M836F2ANJ	30148877		1	
38	Shield Cover of Electric Box	01592092		1	
39	Electric Box Cover1	20122154		1	
40	Electric Box Assy	20402557		1	

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Take-back of electrical waste
Information for Users to Disposal of electrical and electronic equipment (private households)

Icon on the product or in the accompanying documentation means that used electric or electronic products must not be disposed together with domestic waste. For the correct disposal of the product hand it over to a place for take-back, where it is collected free of charge. By correct disposal of the product you can help to preserve valuable natural resources and help in preventing potential negative impacts to environment and human health, which could be consequence of incorrect disposal of waste. Ask for more details from local authorities, nearest collection point, in Waste Acts of respective country, in the Czech Republic in Act no. 185/2001 Coll., in the wording of later regulations. In case of incorrect disposal of this waste, a fine can be imposed according to national regulations.

Manufacturer:

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London W1F 7LD, UK

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Toll-free info line:
+420 800 100 285